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How to cite:

Arato, M. (2016). Integration of private firms in rural development strategies: The case of rural communities from the Chihuahuan Desert in Mexico. Doctoral thesis. Ghent University.

ISBN number: 978-90-5989-876-9

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Integration of private firms in rural development strategies: The case of rural communities from the Chihuahuan Desert in Mexico

Dissertation submitted in fulfilment of the requirements for the degree of

Doctor (PhD) in Applied Biological Sciences

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Acknowledgements

Firstly, I would like to thank my promoters: Prof. dr. ir. Guido Van Huylenbroeck and Prof. dr. ir. Stijn Speelman. I really appreciate your trust, guidance and valuable advice throughout all this process. Thanks Prof. Van Huylenbroeck for believing in this project, and special thanks to Stijn for his endless support.

I also would like to thank the officials and representatives from Consejo Nacional de Ciencia y Tecnología 'CONACYT' and Instituto de Innovación y Transferencia de Tecnología Nuevo León 'I2T2' for granting me with the scholarship to perform this doctoral research. In particular to Ilsa Torres for her valuable support and professionalism. Additionally, I would also like to express my gratitude to Noé, Raúl and Mireya Marmolejo, as well as to all the Multiceras' family. Thank you very much for your support and for being a crucial part of this accomplishment.

I would like to express my gratitude to Prof. dr. María del Mar Delgado Serrano, Prof. dr. ir. Marijke D'Haese, Prof. dr. Joost Dessein, Prof. dr. ir. Patrick Van Damme, and Prof. dr. ir. Stefaan De Smet for their willingness to participate in my examination committee. Their valuable comments on this PhD dissertation were very useful to improve its quality.

Furthermore, I am indebted to my dear family: *para Lesle, mi corazón y eterno agradecimiento por todo lo que eres y representas para mí. Muchas gracias por creer desde siempre en 'el viaje de la nave nodriza'. A mis padres, muchas gracias por su amor incondicional, por su apoyo y sobre todo por su ejemplo de vida. Muchas gracias por arropar a todos los que los rodeamos en un halo de amor infinito. A mi hermana Zulemi, muchas gracias por tu cariño y por estar siempre cerca de mí. A Carlos, toda mi admiración y cariño por estar siempre presente y por ser un excelente padre. A Carlitos, todo mi cariño. Muchas gracias a mis abuelos por su cariño y por los sabios consejos que me han ayudado en todas las etapas de mi vida. Gracias también a mi tía Anita y a todos mis tíos y primos. Incluyo también un especial agradecimiento al Lic. Andrés Gómez Aguirre por sus enseñanzas y por su honorable ejemplo de vida.*

I also wish to say 'thank you' to my colleagues at the faculty and to all my friends-family. To Ray and Chantal, thank you very much for your kindness and to make me feel that an extension of my family was just here in Belgium with you. Ray, your strength, courage

and positivity are a valuable example of life. Thanks to my friends that have been there despite the distance and to all my friends in Gent, thank you very much for all.

And last but not least, I would like to thank God for this astonishing life.

Miguel Jaime Arato Garza

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List of abbreviations

CEO	Chief Executive Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CCO	Chief Community Officer
CoP	Communication on Progress
CSR	Corporate Social Responsibility
CONABIO	National Commission for Knowledge and Use of Biodiversity (Mexico)
CONAFOR	National Forestry Commission (Mexico)
IRD	Integrated Rural Development
LGDFS	General Law for sustainable development of forest
MU	Monetary Units
NTFP	Non Timber Forest Products
NGO	Non-governmental organization
NOM	Mexican Official Norms
PPP	Public-private partnerships
PF	Private Firm
PROFEPA	Federal law enforcement organism for environmental protection (Mexico)
RDA	Rural Development Agency
SEMARNAT	Secretary of environment and natural resources (Mexico)
SME	Small and Medium Enterprise
UN	United Nations
UNGC	United Nations Global Compact
VCM	Voluntary Contribution Mechanism

Chapter 1.

1.1 Introduction

1.1.1 Integration of private firms with multi-sectorial development teams

In today's global economy, where nations share serious concerns about the environment and the need to use natural resources rationally, new requirements have been established for rural development plans. Recent rural policies have included multifunctional strategies that combine rural and non-rural activities to build sustainable rural livelihoods within a territorial framework. In most cases, central governments have taken a leading role in encouraging different strategies, including policies, incentives, operative loans and subsidies. However, in some cases, government-led strategies have struggled to achieve the expected results and to maximize the use of local resources. This is principally due to the generalized scope of these policies and their lack of flexibility, as well as the centralized decision making, resource allocation and management processes involved (Ray, 1997; Murdoch, 2000; Nemes, 2005).

New approaches to rural development focus on reoriented activities to maximize the benefits on a territorial basis. Rural development policies are now encouraging development strategies as means of fostering active participation by local actors who then assume shared responsibility for generating their own socio-economic development (Ellis, 2000; Ellis and Biggs, 2001; Drabenstott, 2003; Durand and Van Huylenbroeck, 2002). Recent rural development strategies have promoted the active participation of multi-sectorial actors, supporting sustainable development through partnerships and strategic arrangements with rural actors. Policy prescriptions and research initiatives from international organizations and governments (i.e. The European Union's Agricultural Research for Development 'ARD') encourage their strategies on developing the knowledge, skills and the entrepreneurial abilities of the local population as a way to foster improvement (Ray, 2000; Blowfield and Frynas, 2005; Frynas, 2005; Nemes, 2005; Narrod et al., 2009; Shucksmith, 2010).

This dissertation includes a thorough exploration of a form of public-private partnership strategy known as Integrated Rural Development "IRD". The aforementioned strategy involves cooperation between private firms, policymakers and citizens for the benefit of their rural region, as a basis for successful development (De Janvry, 1975; D'Silva and Raza, 1980; Ruttan, 1984; Cohen, 1989; Feinerman and Komen, 2003; Giessen and

Böcher, 2008, 2009; Arato et al., 2014b). During recent decades, an increasing number of private firms have taken a proactive role in rural communities by getting involved in environmental and societal strategies alongside their economic interests. More often, private firms are encouraging strategic multi-sectorial collaboration with governmental and civic institutions, as well as with international organizations, in order to generate benefits for their employees, customers, suppliers and associated society (Carroll, 1991; Martin, 2002; Blowfield and Frynas, 2005; Utting, 2005; Cruz, 2009; Archel et al., 2011; Ma, 2012; UN Global Compact, 2013, 2014).

The involvement of private firms is a key element in fostering integrated rural development IRD strategies, because they can provide the means to develop economic activities that would benefit the actors involved. However, participation in such strategies demands structural and, in some cases, profound cultural and social change by all the stakeholders involved (Goldsmith, 1985; Murdoch, 2000). Stakeholders (policymakers, local representatives, private capital and rural citizens) are expected to shift from a traditional style into a more inclusive and pro-active role. The main change expected from private firms, for instance, is to take on a more pro-active role, moving from their traditional position as a mere 'buyer' or 'job provider', to act as a driving force for development. Private firms within an integrated value chain for natural goods are expected to act as a strategic partner, providing not only market opportunities for rural producers, but also to share with them the technology, skills, and knowledge necessary to help them to improve the added value of the rural outcome (Morgan, 1997; Bolster and Brimble, 2008; Pradhan and Ranjan, 2010). For rural stakeholders, IRD demands the necessary commitment to participate in production groups or cooperatives and a willingness to agree on a common strategy that represents interests from – if possible – the majority of the members. Stakeholders must also be committed to ensuring correct operation according to the local regulations (fiscal, environmental and labour). While for the rest of the stakeholders IRD demands the commitment to facilitate the resources and the means to secure the proper development of the relevant actors.

In return for their participation in IRD strategies, and in addition to improvements in socio-economic aspects for the rural actors involved, private firms should also obtain different benefits, such as a continuous supply of natural products; strengthening of their supply chain; risk management actions; cost reduction through eco-efficiency and recycling; positive market recognition; access to specific market niches; as well as

improving employee morale and reducing staff turnover (Goldsmith, 1985; Carroll, 1991; Saraceno, 1995; Ray, 2000; Martin, 2002; Utting, 2005; O'Connor and Meister, 2008; Archel et al., 2011; Arato et al., 2014).

Although there are potential benefits, a common question among developers, scholars and stakeholders, relates to the possible drivers that could trigger the integration of private firms within rural development. Policy makers and recent empirical literature have advocated Corporate Social Responsibility 'CSR' as one of the main drivers for private firms' proactive involvement in relevant environmental and societal strategies, beyond their natural economic interests (Blowfield and Frynas, 2005; Frynas, 2005; Narrod et al., 2009). To date, a broad variety of theoretical and empirical research exists in relation to the role of private firms involved in rural development strategies through CSR strategies. As indicated above, socially responsible companies participating in an integrated value chain for natural goods, obtain different benefits in return for their social investments. Moreover, firms whose value chains does not include rural producers (i.e. financial services, mobile telecommunications, manufacturing, construction, chemicals and others) might also have the opportunity to generate the aforementioned benefits from their participation in integrated rural development strategies. Through Corporate Social Responsibility and stakeholder management strategies, firms could manage potential risks and contribute to the improvement of socio-economic conditions within the rural communities in close proximity to their manufacturing or administrative sites.

1.1.2 Problem statement

Integrated Rural Development initiatives demand a mutual and reciprocal approach to stakeholder mobilization in order to ensure that all interests are addressed and to involve only those actors who are deeply committed to the development process (Giessen and Böcher, 2008). Relevant actors would only enter into integrated projects if specific interests are fulfilled. To date, most of the theoretical background relating to integrated rural development explores the expected changes in policies and interactions with the institutions involved, describing how organizational culture should be modified in order to ensure the success of these strategies. However, there is limited exploration of the interests and drivers that could potentially encourage participation by key actors, given the challenges that must be addressed when participating in IRD strategies. This dissertation identifies, from the relevant literature, the most common drivers and

challenges that could be encountered by each member, according to their own set of interests. The identified concepts have also been tested empirically in the dissertation. The objective was to identify, empirically, the type of drivers that encouraged relevant actors to solve their own challenges and succeed with their integrated rural development project.

Corporate Social Responsibility initiatives have been identified as one of the main drivers for private firms to collaborate in rural development. However, there are significant obstacles that must be addressed by firms when encouraging such strategies. For instance, companies undertaking costly initiatives could end up risking their price-cost competitiveness. Other obstacles relating to multi-institutional interactions may result in bureaucracy and over-regulated processes, taking up resources and incurring costs for companies (principally during the early stages of the process) without generating meaningful societal benefits in return (Martin, 2002). Management's challenge in terms of CSR involves identifying and deciding which social causes and stakeholders should receive priority consideration in the decision-making process (Carroll, 1991; Hillman and Gerald, 2001; Carroll and Buchholtz, 2014). The literature offers a broad exploration of CSR's benefits, as well as its negative side (Goldsmith, 1985; Saraceno, 1995; Ray, 2000; Richter, 2005 Blowfield and Frynas, 2005; Utting, 2005; Frynas, 2005; Narrod et al., 2009; Carroll and Shabana, 2010; van den Heuvel et al., 2011; Rasche and Gilbert, 2012). In the public debate there is mainly a focus on the challenges and improvement opportunities of CSR in terms of regulations, transparency, reporting, measuring and applicability.

However, with a broad concept such as CSR, what is missing is an analysis of which strategies would best fit the interests of private firms when engaging in rural development. Firms are generally subject to specific budgets and profit maximization challenges (Utting, 2005; Cruz, 2009; Archel et al., 2011).Therefore, actions relating to CSR are expected to be performed within certain parameters and scope, according to the firm's objectives and business philosophy (Murray and Voguel, 1997). For those decision makers convinced of the benefits and applicability of CSR for rural development, there is only limited literature explaining the type of strategies that could be applied by private firms in relation to rural development. With the intention of providing managers, scholars and stakeholders with relevant information about the main challenges, motivations and the type of strategies deployed by private firms, this dissertation includes an empirical

exploration of the different companies that are currently applying rural development strategies through CSR.

For private firms, once they have identified their drivers and have established their CSR strategies for rural development, the journey towards successful outcomes is only just beginning. Although contemporary development policy prescriptions place emphasis on the potential for closer integration of poor producers with global markets through value chains based on natural resources (Bolwig et al 2010, Metzger et al. 2010, Trienekens 2011), in practice, this integration represents a significant number of additional constraints not generally observed at macro-level. The working relationship with small and medium scale producers, and principally with those from developing countries, which have a number of socio-economic disadvantages, represents additional complications and challenges for the chain stakeholders that go beyond the economic approach assessed by the traditional value chain analysis tools.

Along with cost-reduction and improvement strategies, members of global value chains based on natural resources (sourcing channels, producers, distributors and final consumers) should also consider non-traditional aspects associated with small-scale producers, such as social, cultural, environmental and political factors. In order to fully understand the role and potential of chains, there is a need to move beyond descriptions of product flows, to examine how supply chains are built, shaped and reproduced over time and space (Marsden et al., 2010). The empirical literature recognizes the importance of analysing both the 'horizontal' and the 'vertical' dimensions of governance within a value chain. Authors recommend examining the social relationships of trust and cooperation between the actors within a network, with a view to identifying obstacles and opportunities (Jarosz 2000; Tallontire, 2007; Tallontire et al, 2011; Peterson 2013). Along the same lines, Block et al. (2008) propose a "value web" approach that considers the different dimensions in which a value chain develops and the interactive and iterative relationships between the actors involved.

This dissertation includes a novel application of a framework known as 'Rural Web analysis' to the selected empirical case study. The present dissertation assesses the applicability of the Rural Web as a tool to analyse the interconnections between six different dimensions of the value chain (below described). The Rural Web also allowed us to gain analytical insights that would remain hidden when applying a linear (producer

to consumer) analysis of a value chain. Moreover, greater understanding can be achieved in relation to the strategic linkages between the actors involved in generating a product's value and also with other actors who have an indirect effect on the agribusiness value chain.

With regard to integrated development strategies, constraints relating to the efficiency of resources distribution are often stressed by authors, policy makers and development agents (Hansen and Tarp, 2000; Jayne et al., 2001; Collier and Dollar, 2002; Lyon, 2003; Doucouliagos and Paldam, 2009). Development agents have traditionally been reluctant to provide cash to beneficiaries. An important motivation behind this reluctance was the belief that beneficiaries would spend these monies on immediate consumer goods without a long term benefit (Riddell, 2007; De Hoop et al., 2010). Empirical experiments have tested the assumption that transferring cash to beneficiaries would result in low investment in local public goods with long term benefits (De Hoop et al., 2010). Generally, a factor that affects the efficiency of resource distribution and the generation of improvements through multidisciplinary groups is the willingness by community members to collaborate in communitarian strategies. In some cases, individual short-term self-maximizing behaviour undermines cooperation. Groups might not work unless the individual members are convinced that they would gain a personal benefit (Kamara and Kargbo, 1999; Lyon, 2003).

This dissertation includes an empirical analysis that seeks to identify how the generated income is used by the rural families involved. The main interest behind the experiment was to anticipate whether rural commoners would acquire assets or goods that, in turn, would generate future returns to improve their living conditions in the medium and long-term, as well as to assess their willingness to collaborate in the development of community goods such as clinics, schools and social spaces, among others.

1.2 Objectives, research questions and hypotheses

1.2.1 Objectives

The main objective of this PhD thesis is to assess whether, from the perspective of private firms, integrated rural development is a workable paradigm to target sustainable development and, to illustrate, by means of a case study, its effects, possibilities and

difficulties. The selected case study is based in a region known as the Chihuahuan Desert, in northern Mexico.

According to our case study, this dissertation includes the following sub-objectives:

i) Assess the interests and drivers that encourage participation by relevant actors in integrated rural development strategies.
ii) Explore the role of corporate social responsibility as driver for rural development and to assess how it is currently applied for that purpose.
iii) Assess the socio-economic configuration and the main linkages, constraints and drivers that facilitate or hinder the integration of natural resource value chains.
iv) Assess the potential expenditure behaviour of rural communities and to evaluate the potential effects of social investments on rural development.

1.2.2 Research questions

To better understand the different constraints that facilitate or hinder the integration of private firms in sustainable rural development, a framework has been developed to address the following research questions:

- Given the challenges that must be addressed when participating in IRD strategies, what are the possible interests and drivers that encourage participation by the relevant actors (government, civic institutions, private firms, others)?

- What kind of Corporate Social Responsibility strategies are currently applied by private firms towards rural development? What is the role of CSR in rural development?

- What are the main linkages, constraints and drivers that facilitate or hinder the integration of private firms with small rural producers in a value chain?

- In the case of a rural development project that aims to generate future surplus income for rural commoners, is it possible to assess the potential future expenditure behaviour of rural commoners, in relation to a theoretical surplus income? What are the potential ways in which rural families could utilize a surplus

income? Would they collaborate with the development of community goods (clinics, schools, social spaces, etc.)?

1.2.3 Hypotheses

The following is a list of hypotheses that will be tested in the development of this dissertation

- By incorporating all needs in the value chain development, Integrated Rural Development can be a workable rural development strategy. The success of its contribution relies, to a large extent, on the collaboration of all the relevant parties from the value chain to ensure the proper preservation of resources, the improvement of rural areas, access to technology, professionalization of production skills and others.

- Integrated rural development projects provide a means to encourage development through active participation by the relevant actors (rural producers, private firms, governments, civic institutions, others). The key element for its success relies on the proper identification of the motivating factors which, in turn, would encourage each actor to get actively involved in such initiatives.

- Corporate Social Responsibility is a feasible driver for private firms to support rural development. There are private firms currently collaborating in rural development, however the number is still limited. Although rural development might not be relevant for all, the main challenge for the interested firms is to find the best strategies according to their business models and interests.

- A rural web analysis might reveal relevant insights into the socio-economic configuration of value chains whose early stage development is based on small and medium size rural producers. Dialogue between the relevant actors and an understanding of the relationships that occur at different dimensions of a value chain, are two of the key elements that contribute to the successful development of value chains.

- A critical part of understanding the interests of the rural population is to assess the potential use of the benefits generated by rural development projects. Understanding this would provide development agencies, private firms and governments with an insight into whether the rural population would acquire assets to improve their living conditions in the medium and long-term. This knowledge would also serve to define dialogue channels to provide mentorship and access to financial tools that would encourage expenditure behaviour that could help to break the poverty cycle or instigate the development of community goods such as clinics, schools, social spaces, among others.

1.3 Introduction to the case study

1.3.1 Case study: the rural communities from the Chihuahuan Desert

The selected case study is based in the northern part of Mexico, in a territory known as the Chihuahuan desert. The area is composed primarily of a semi-arid ecosystem with extreme climatic conditions which limit the opportunities for agriculture and other economic activities. For most families, the collection, processing and commercialization of natural goods (principally non-timber forest products) represent their main means of employment and an important source of income (Marshall et al., 2006, Arato et al, 2014). This dissertation analyses the integration of different actors involved in an economic activity based on the collection and processing of a natural good present in this area, known as the candelilla plant (*Euphorbia antisyphilitica)*. Candelilla is an interesting case because of its potential contribution to poverty alleviation in marginal areas, and its unique potential to access markets across a wide variety of industries worldwide. Its potential demand could be at least ten times higher than the current sales figures, which were already in excess of US$ 7 million in 2012 (Multiceras, 2013). Moreover, the rural development project analysed in chapter 5 matches the description and characteristics of the IRD philosophy. Commercialization of non-timber forest products has been promoted by researchers, conservation and development organizations and more recently by governments as a means to achieve rural livelihoods improvements, in a context of commitments to address rural poverty (e.g. Sustainable development goals) (Marshall et al., 2006; Belcher and Schreckenberg, 2007; Morsello et al , 2012). Some interesting focus species in Mexico or other tropical regions were for example assessed in the PAVUC project, they included different species like tropical highland blackberries *Rubus*

spp., naranjilla *Solanum quitoense*, and tree tomato *Solanum betacea*, red pitahaya *Hylocereus spp*., berrycactus *Mirtillocactus spp*., and cashew apple *Anacardium occidentale* (PAVUC Project, 2011). However this work focuses on candelilla because of the close relationship of the author with the value chain and its actors prior to the PhD research.

The wild collection of candelilla in Mexico takes place in the states of Durango, Zacatecas, Chihuahua, Nuevo León, San Luis Potosí, and Coahuila. Trained collectors usually pull up plants by hand, harvesting the entire aboveground parts of the plant. The collectors transport the plants in bundles, principally on the back of mules, to the processing sites where the water supply is sufficient for processing (Barsch, 2004; Schneider, 2009). In the first stage of processing, which is done in the local communities, the plant material is boiled, to obtain the wax in its simplest non-purified form, called '*cerote'*. This product then moves along the supply chain increasing in added value, as provided by the different actors at the later stages along the value chain. It is estimated that the extraction of candelilla currently represents the main source of income for about 3,000 families. Since this activity has not yet reached its full potential, it is believed that many more of the 46,000 families in the Chihuahuan Desert could base their livelihood on it (Registro Agrario Nacional: Padrón e Historia de Núcleos Agrarios 'PHINA' Rural Census, 2012).

The commercialization of candelilla is regulated by the Mexican secretary of environment and natural resources "SEMARNAT" through its Mexican Official Norm: NOM-018-SEMARNAT-1999. The plant is collected from its wild environment and processed to extract a wax product known as *cerote*, which is transformed into candelilla wax through a refining process. The activity is mainly undertaken by men with sporadic support from the women. Most *candelilleros*, as they are called, collect the plant from communitarian land properties. These are extensions of common land provided to a group of tenants, based on the Political Constitution of the Mexican United States (Art. 27) and the internal regulations of the communitarian assembly. The tenants are entitled to undertake agricultural activities and utilize the natural resources (including candelilla and other wild species available), as stated within the utilization permits issued by the Mexican authorities who regulate the rational use and preservation of the resources (CONAFOR 2008). Due to its characteristics, candelilla wax is a highly valued product for speciality applications in different industries, such as cosmetics, pharmaceuticals, the food industry,

graphic arts and printing, among others. The main consumers of candelilla wax are international markets in the USA, Europe and Asia, where 90% of the production volume is traded. The domestic market in Mexico accounts for less than 10% of the total volume produced. Mexican refinery companies are also participants in the candelilla value chain, as they export the product to firms from the abovementioned markets (principally wholesale distributors and some large scale producers). Candelilla wax reaches final consumers in the form of a component for speciality consumer goods (Arato et al. 2014).

1.4 Thesis outline and framework

This dissertation consists of eight chapters organized into three parts. The first part explores the concepts of Integrated Rural Development and Corporative Social Responsibility from a theoretical and broader empirical perspective. This part contains two chapters. Chapter 2 provides a theoretical analysis of the IRD concept and its' relevance for the empirical analysis. It also explores the benefits and challenges of IRD, as identified in literature. Chapter 3 offers a theoretical and empirical analysis regarding the participation of private firms in rural development initiatives through CSR. The results from the empirical analysis in this chapter support our hypothesis that private firms from different industries and countries find in CSR a strong driver for their participation in rural development.

Using the theoretical background from the previous part, the second part tests the IRD concept for the case study. It starts with chapter 4 which describes the geographical region and the value chain selected for the empirical case study. It assesses the contribution of non-timber forest products (NTFP) value chains and, in particular, the candelilla wax chain, to foster sustainable rural development. This chapter describes the selected empirical case study, the different actors involved in the value chain, as well as the current socio-economic situation for the relevant communities from the Chihuahuan Desert in northern Mexico. Chapter 5 provides an empirical exploration of the integrated rural development concept. This dissertation uses this concept to assess development opportunities in our case study. As shown in figure 1.1, IRD acts as a catalyst for the transition from the 'current situation' into the 'expected situation', as represented by a dotted line.

The third part of this dissertation analyses the further impact of the IRD strategy on the rural community. It contains chapter 6, which assesses the applicability of the Rural Web framework for socio-economic analysis of a value chain based on natural goods. Working with small rural producers presupposes a series of constraints that are not commonly considered or assessed in traditional value chain analysis. Therefore, the framework known as 'Rural web analysis' could provide a complete assessment of the different linkages and relationships that occur between the relevant actors on different dimensions of the social, environmental and economic aspects of the case study. This dissertation aims to assess the application of the Rural Web framework as a tool to identify strategic relationships between the relevant actors in order to drive the transition of the 'current situation' into the 'expected situation'.

Also included in the third part is Chapter 7. This chapter describes a microeconomic simulation game developed to assess potential future use of income. Generally, the aims of poverty reduction and income improvement through development projects depend on the best intentions of the participants. A development project's success relies greatly on the commitment of rural participants to generate medium and long-term benefits for their self-development. This dissertation utilizes the proposed simulation game to identify potential expenditure behaviour by the rural commoners involved. The game evaluates the use of a hypothetical surplus income that would be generated through the development project addressed in the case study. The results from the simulation game represent an image of the 'expected situation' for the relevant rural commoners, reflecting their interests and their potential expenditure and saving behaviour. It also provides an outlook on their possible interests in developing common goods to contribute towards their future wellbeing.

Finally, chapter 8 concludes the dissertation by revisiting the research questions and assessing to what extent the empirical work on the case study has enabled us to provide answers or recommendations and issues for further consideration.

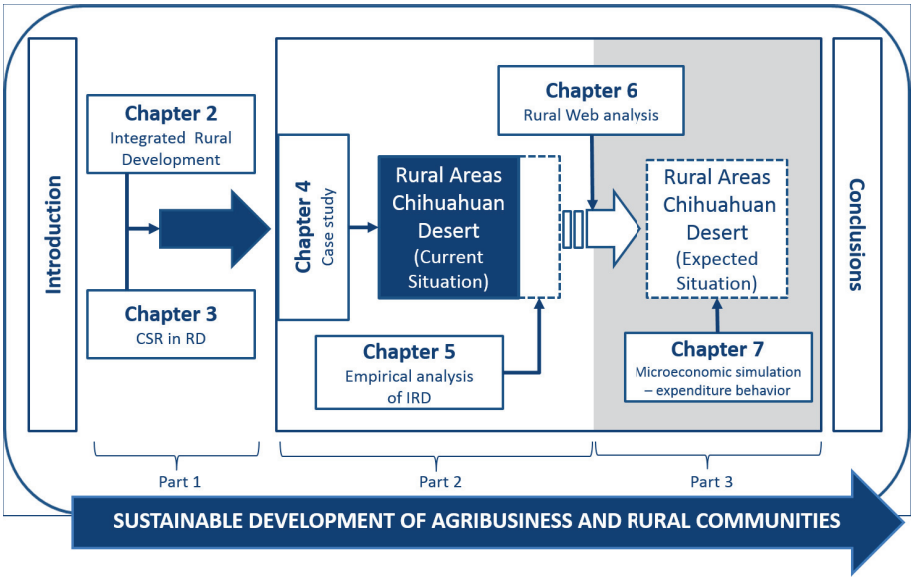

Figure 1.1. Thesis framework.

Chapter 2: Theoretical framework about the benefits and challenges of integrated initiatives for rural development

Abstract

This dissertation explores the application of a form of public-private partnership strategy known as Integrated Rural Development "IRD" as a mean to integrate strategic partners to foster rural development through sustainable business models. As shown in the introductory chapter, to date there exists limited exploration of the interests and drivers that could potentially encourage participation by key actors in IRD strategies and also insufficient attention has been given to the challenges that must be addressed when participating. Therefore, the present chapter provides a theoretical exploration of the different implicit benefits and challenges that are found when designing and applying integrated rural development ('IRD') initiatives. The main objective of this chapter is to explore what literature is identifying as motivational drivers, benefits and challenges for integrated rural development. The learnings from this chapter will serve as theoretical background to complement the empirical analysis of the case study described in the following chapters.

This chapter is based on:

Arato, M., Speelman, S., & Van Huylenbroeck, G. (2014). Benefits and Challenges of Integrated Initiatives for Sustainable Rural Development: The Case from Northern Mexico. OIDA International Journal of Sustainable Development, 7(04), 31-48.

2.1. Introduction

A variety of approaches for rural development have been tested globally during the last 60 years (Ellis and Biggs, 2001. Central governments have taken a leading role in these development strategies in different ways: through policies, by providing incentives, operative loans, subsidies and so on. However government-led strategies sometimes have difficulties to meet the expected results principally because: i) the centralized approach of development policies and its inflexible application (Lowe et al., 1998; Giessen and Böcher, 2008); ii) the lack of a proper focus, control, measuring and following-up of development strategies what generates different inefficiency related problems such as lack of competitiveness, conformism and dependency of rural inhabitants (Freeman and Karen, 1982; Goldsmith, 1985); as well as iii) the limited participation of local actors like private firms, regional representatives and local governments. This diminishes the opportunity to maximize the use and application of local resources and territory-specific development initiatives based on integrated agribusiness value chains (Ray, 1997; Murdoch, 2000; Nemes, 2005).

New forms of rural development approaches are encouraging rural development strategies as a mean to generate active participation of local actors to assume shared responsibility for bringing about their own socio-economic development (Ellis, 2000; Ellis and Biggs, 2001; Drabenstott, 2003; Durand and Van Huylenbroeck, 2002). Endogenous development, as addressed by Nemes (2005), represents a significant change from traditional strategies based on capital investments (infrastructure, incentives and subsidies) to invest in developing the knowledge, the skills and the entrepreneurial abilities of the local population as a way to foster improvement. Although traditional packages of infrastructure development, grant-aid, loan-finance, business and community support services are still necessary, development agencies have recognized that long-run development gains are likely to be secured more effectively by encouraging entrepreneurship at regional level and by adapting the traditional strategies to local social and cultural context (Slee, 1994, Nemes, 2005). Related to this line of thoughts Ray (2000) recommend three key concepts that must be considered when designing development strategies: act in a territorial basis, utilization of local resources, and generate local contextualization through active public participation. In other words, for rural development policies to meet diverse needs and circumstances, they must consider

the mobilization of local actors supported by partnership structures and proper arrangements (Shucksmith, 2010).

Integrated rural development "IRD" comprises the cooperation between policymakers, administrators from various economic sectors and citizens to ensure benefits of their rural region as the foundation of successful development (Giessen and Böcher, 2008). Integrated rural development gives a new role to the state as a coordinator, manager or enabler rather than as a provider and director. Other expected activities are the formation of tangled hierarchies; flexible alliances and networks; the inclusion of new partners, notably from the private sector and civil society; all this can be governed through local governments and representatives (Shucksmith, 2010).

Private firms can also be an important part of the integrated rural development strategies (Goldsmith, 1985). Because the IRD philosophy demands changes in traditional behaviours from all actors (Murdoch, 2000), the main change expected from private firms is to switch into a more pro-active role, changing from their traditional position as a mere "buyer" or "job provider", to act as a driving force for development. Private firms in an integrated value chain are expected to act as a strategic partner providing not only market opportunities for rural producers, but also to share with them technology, skills, and knowledge necessary to improve the added value of the rural outcome (Morgan, 1997; Goldsmith, 1985). In return private firms shall obtain different benefits such as a continuous supply of their products; strengthening of their supply chain; and improvement of their position to manage the risks involved in the process (Goldsmith, 1985; Saraceno, 1995; Ray, 2000). Another opportunity for private firms generated by IRD is to diversify their product portfolio with value added products to gain access to specific market niches. Companies could therefore gain recognition and positive market perception through social responsibility and responsible sourcing strategies (Carroll, 1991; Martin, 2002; O'Connor and Meister, 2008; Archel et al., 2011).

An example reflecting the idea of integrated rural development is the European Union's LEADER community initiative. Notwithstanding its different revisions (Giessen and Böcher, 2008), its primary scope is to enable joint work of local actors to find innovative solutions to rural problems, reflecting what is best suited for their areas and that could also serve as models to encourage developing initiatives in other areas (EU commission, 2000; Shucksmith, 2010). The EU's LEADER program is characterized principally by

the high levels of local stakeholder and community involvement; by partnership and cooperation; and by the encouragement of innovative approaches to rural development (Land Use Policy Group, 2005).

Notwithstanding the implicit benefits from IRD, there are also sufficient challenges that must be addressed by all actors in order to succeed in integrated rural development initiatives. The list of challenges that could hinder the success of development initiatives include: the level of (dis)integration of the supply chains (Goldsmith, 1985); the high grade of risk involved in working with rural producers (Shortfall and Shucksmith, 1998; Murdoch, 2000); the inflexible and traditionalist rural policies (Giessen, 2008); and the differences in interests and expectations between the actors involved (Nemes, 2005; Giessen and Böcher, 2008; Shucksmith, 2010).

Most of the theoretical background related to integrated rural development explores the expected changes in policies and interactions of the institutions involved, describing how organizational culture should be modified in order to ensure the success of development initiatives (Yudelman, 1976; Ahmed, 1977; Ruttan, 1984; Cohen, 1989; Shucksmith et al., 1994; Shortfall and Shucksmith, 1998; Giessen and Böcher, 2008). However there is limited exploration on the interests and drivers that could possibly encourage the participation of key actors, given the challenges that must be addressed when participating. The present chapter focuses on a theoretical exploration about the different implicit benefits and challenges found when designing and applying integrated rural development initiatives. For this analysis the main differences that exist between traditional and integrated strategies are evaluated along with the expectations and motivational drivers from the relevant actors to actively participate in IRD.

The present chapter starts with a theoretical exploration of the key concepts of the integrated rural development philosophy. Next a comparison is made between traditional and integrated rural development initiatives and a number of key recommendations for the application of IRD projects derived from literature are discussed. In the following section the motivation of and the challenges for the actors involved are identified. The chapter ends with a discussion of the main findings and some general remarks about IRD and its' application.

2.1.1 Conceptualization of Integrated Rural Development initiatives

Integrated Rural Development has its origins back in the late 1960s and early 1970s. It became an increasingly important focus of efforts in bilateral and multi-lateral development assistance programmes. Integrated rural development became one of the major approaches used by policy makers to respond to rural inequality (De Janvry, 1975; D'Silva and Raza, 1980; Ruttan, 1984; Cohen, 1989). During the 1970s and 1980s, IRD became the basis for rural development projects and programmes of the World Bank. The concept of IRD, according to the World Bank consisted of three main dimensions: address the problem of rural poverty; increase the productivity and generate higher incomes for rural producers; and promote a multi-sectorial approach to rural development, integrating the various dimensions of a rural community into a coherent, action-oriented project (De Janvry, 1975; Yudelman, 1976; Ahmed, 1977; Ruttan, 1984).

However, the literature related to IRD is full of controversies. Already by the late 1970s and early 1980s the integrated approaches to development were severely questioned. Scholars and aid practitioners began questioning the real effectiveness of such integrated projects (Ruttan, 1984; Cohen, 1989; Shortfall and Shucksmith, 1998). The integrated rural development approach drew on a complex of often mutually contradicting intellectual and ideological perspectives (Ahmed, 1977). The main critics concentrated on the fact that the rural development programmes were not able to solve one of the most fundamental rural problems: achieving a reliable food surplus. Among the reasons that caused the decline in emphasis on IRD was its' dependence on the - no always efficient - bureaucratic performance from central governments. In many cases, central governments from developing countries were unable to secure the effective organization and mobilization of resources for rural development. The authoritarian regimes were generally unwilling to decentralize the political power and control (Lacroix, 1985; Cohen, 1989).

In spite of the critics, the idea of IRD was not completely discharged given the positive results reported by successful empirical cases in Latin America, Asia, and Europe (Lacroix, 1985; Cohen, 1989; Shucksmith et al., 1994; Shortfall and Shucksmith, 1998; Giessen and Böcher, 2008). During the 1990s policy makers and experts continued exploring technical and institutional changes to complement the multi-sectorial approach of IRD (Kearney, 1994). In recent years, scholars and policymakers have explored

different forms of social organization and interactions to mobilize the political and economic resources necessary for massive structural reform. The inclusion of non-traditional partners, like private firms as strategic allies, was identified as crucial to generate new sources of income growth. Private firms were expected to provide not only market opportunities for rural producers, but also to share with them technology, skills, and knowledge necessary to improve the added value of the rural outcome (Morgan, 1997; Ray, 2000; Giessen and Böcher, 2008; Dutrénit, 2012). In the most recent version of IRD the focus is on involving all stakeholders in the value chain through a different form of interaction (Murdoch, 2000). With this approach to IRD, it is expected that all stakeholders would play a different role than the traditionally observed, i.e. central governments instead of encouraging the traditional type of development strategies based on subsidies and grants, they will now encourage a different type of support based on the provision of knowledge, technology, business development, and boost economic development through operational capabilities in the communities (Morgan, 1997; Murdoch, 2000). Likewise it is expected that private firms will replace their traditional role of "buyer" or "generator of income sources" to act as a key driver of rural development by providing capital, expertise and opportunities to rural producers. In return they strengthen their supply chain, obtain a possible diversification of products (Goldsmith, 1985; Saraceno, 1995; Ray, 2000), and a positive brand image through corporate social responsibility programs that have been so popular in recent years (Carroll, 1991; Martin, 2002; O'Connor & Meister, 2008; Archel et al., 2011).

Among the expected changes in approaches, roles and interactions, IRD comprises a high level of cooperation between central government and local actors. The actors involved should collaborate within a dynamic environment that promotes communication and provides the local actors like civil organizations, private firms and rural producers a strategic participation in the decision making process related to the design and implementation of development strategies (Saraceno, 1995; Murdoch, 2000; Nemes, 2005; Giessen and Böcher, 2008). With respect to the provision and management of development resources, IRD considers a distribution of resources through different regional levels of governmental institutions, but controlled by central institutions or a bi-lateral coordination team, in the case of joint resources with private firms. The provision should be accompanied with specific control, follow up and efficiency measurement of

resource utilization and outcomes (Lowe et al., 1998; Murdoch, 2000; Nemes, 2005). The latter, should preferably be performed by a multi-disciplinary team.

To ensure the medium and long term positive effect of the development resources, instead of traditional subsidies and complementary cash transfers oriented principally to consumer goods and fulfil immediate needs, the recent IRD approaches considers the provision of credits and loans oriented to reduce access-type disadvantages of rural producers. The active participation of private firms and local actors would facilitate entrepreneurship and local business development. Through the participation of multi-disciplinary actors, principally private firms, IRD also promotes the provision of technology and skills necessary to improve the local products. This in order to access national and global markets with specialty and added value rural products (OECD, 1996; Ray, 1997; Nemes, 2005; Giessen and Böcher, 2008; Giessen and Böcher, 2009).

2.1.2 Differences between traditional and Integrated Rural Development initiatives

Compared with traditional development initiatives, integrated rural development projects recommend different interaction patterns between the participants involved. When comparing IRD strategies against traditional 'non-integrated' initiatives, new approaches are observed for the involved actors, including institutions like central governments for which power is re-conceptualized as being a matter of 'power to' rather than 'power over', acting as coordinators, managers or enablers rather than as providers and directors (Shucksmith, 2010). Table 2.1 includes an analysis based on applied literature about the expected changes in approaches, roles, interactions and responsibilities related to IRD.

Table 2.1. Comparison between traditional 'non-integrated versus integrated rural development strategies.

Concept	Traditional 'non-integrated' Strategies	Integrated Strategies
Cooperation between central government and local actors	- Limited - Local actors are not considered when designing development strategies.	- High level of cooperation / Dynamic interaction
Management of central resources	- Controlled by Central Institutions. - Resources provided principally by Cash transfer / Lend based incentives directly to peasants. - Limited follow up about utilization of provided resource	- Controlled by central Institutions. - Resources distributed by different government levels (regional). - High control and follow up of resources utilization. - Measurement of resources application efficiency.
Principal application of central development resources Development of local economies	- Reduce and solve resource and access-type disadvantages through monetary incentives, loans and subsidies. - Complementary cash transfers and loans oriented to consumer goods and daily-basis expenses. - Dysfunctional generation of resources and goods	- Reduce and solve resource and access-type disadvantages through economic development and local entrepreneurship. - Loans and subsidies oriented to encourage business and entrepreneurship. - Support to local economic development.
Participation of local development institutions and private firms	- Limited participation, local actors interact in the implementation of development policies but not at the designing stages. - Private firms are generally perceived as externals with limited interaction and just adopt the policies.	- High grade of participation of local development institutions and private firms in the designing and implementation of regional-territorial based development strategies. - Promotion of integrated value chains.
Value added in local products	- Local products are generally traded as raw materials or commodities with low added value. - Limited technology and skills hinders the production of value added products.	- Access to new technologies and skills enables the application of added value to local products.
Access of local products to national or global markets	- Limited competitiveness (Generally traded at local markets)	- Competitive specialty and value added products with access to national and global markets.

Source: Analysis developed by authors based on Ruttan, 1984; Cohen, 1989; Shortfall and Shucksmith, 1998; Nemes, 2005.

As addressed in table 2.1, the authors recognized seven main concepts in which IRD strategies differ from traditional development strategies. The concepts include cooperation between central governments and local actors; management of central resources, application of central development resources; development of local economies; participation of local development institutions and private firms, value addition in local products; and access of local products to national and global markets. For each concept, the table identifies a series of approaches and roles that are commonly taken by the actors involved. For instance, in the case of cooperation between central and local governmental

actors, traditional projects usually consider a limited interaction with local actors during the design of development strategies. While in IRD, local actors have a strategic participation in the strategies designing process, through a dynamic interaction with representatives from the central government.

The same holds for the case of participation of local development institutions and private firms. In traditional models, the execution of the development strategies are mainly through official means and there is only limited participation from locals. Civil institutions and private firms are generally considered as external and are just expected to adopt the policies generated by central institutions. In IRD, the design and execution of development strategies are, since its' conceptualization, generated by multi-level and multi-institutional groups. In IRD, local actors' support is present to identify and include specific territorial conditions and capabilities in order to maximize the output of such strategies.

When considering central resources management, while in both approaches IRD and traditional, the central resources are obviously controlled by a central institution, the distribution, management and reporting are different. IRD considers the participation of local government representatives, civil institutions and private firms to distribute the resources. These actors would also be responsible for the proper use and reporting of outputs, defining specific controls to measure the resources application efficiency. Other differences exist in the type of strategies to distribute the resources. Instead of the traditionally promoted subsidies, cash transfers and sunk cost, IRD considers the provision of loans and microcredits oriented to encourage entrepreneurship and local economic development. IRD foresees the participation of strategic industrial actors that could support local actors with skills and technology necessary to improve local products and train the rural producers to generate value added products. Private firms could also facilitate the access of rural products to national and international markets.

2.1.3 Recommendations when applying Integrated Rural Development projects

Structural and in some cases deep cultural and social changes are demanded when applying Integrated Rural Development initiatives. This section includes a series of recommendations to consider by the actors involved when designing development strategies.

- IRD initiatives should consider the characteristics, conditions, and preservation measures of available local resources. It is mandatory to first evaluate the possible risks and define the proper mechanisms to guarantee its rational utilization and ensure its permanence (Kearney, 1994; Shortfall and Shucksmith, 1998; Murdoch, 2000).

- IRD strategies should be based on local culture, customs and traditions. The inclusion of territorial culture generally motivates local actors to participate actively and committedly in the development initiatives (Saraceno, 1995; Cohen, 1989; Murdoch, 2000; Giessen and Böcher, 2008).

- Objectives and work plans from IRD projects should be developed with the support from local actors (preferentially including members from different representative action groups, memberships and disciplines). Multi-disciplinary and multi-institutional groups generally provide a better understanding about the different interests and approaches from all the parties involved (Lacroix, 1985; Lowe et al., 1998; Murdoch, 2000; Ray, 2000).

- Design and application of key process indicators and control measures to follow up the projects performance and the efficient utilization of resources should be also developed through a multidisciplinary group. Common understanding and agreement about performance indicators would ensure the proper follow up and control of IRD projects. Private firms provide a key element in this task, principally because of their extensive experience in the use and application of performance indicators and efficiency measurement tools (OECD, 1996; Ahmed, 1977; Ray, 1997; Cohen, 1989; Giessen and Böcher, 2008).

- Central government policies and representatives should be flexible enough to adjust criteria and regulations according to regional-specific characteristics, resources and social-spatial configuration (Shucksmith et al., 1994; Nemes, 2005; Giessen and Böcher, 2008; Giessen and Böcher, 2009).

2.1.4 Motivation of and challenges for the actors involved in Integrated Rural Development projects

As stated by Giessen and Böcher (2008), under integrated rural development initiatives a mutual and reciprocal approach to stakeholder identification and mobilization is necessary to ensure that all interests are addressed and to involve actors who are deeply

committed to the process. Relevant actors would only enter into integrated projects if specific interests are fulfilled, therefore in table 2.2 is included a theoretical analysis about the general motivations and challenges that might be present within the actors.

Table 2.2. Motivation and challenges faced by actors in IRD initiatives.

Actor	Motivation	Challenge
Central Government	· Develop a mechanism to solve social problems related to poverty disadvantaged situations. · Efficient distribution of central resources reaching the majority of the population. · Encourage economic activities within unemployed and disadvantaged population. · Decentralize development initiatives. Reduce dependency on central government. · Maximize central resources using other financial sources and partnerships with private capital.	· Develop the necessary flexibility to adjust policies, regulations and criteria according to regional socio-economic characteristics. · Adjust resource management regulations to encourage economic development initiatives and entrepreneurship. · Guarantee the proper functioning of the institutions and its representatives. · Open proper dialog channels for local institutions and private firms to discuss about joint strategies. · Guarantee the proper follow-up, control measures and flow of information.
Local Government	· Mechanism to solve social problems related to poverty and disadvantaged situations. · Encourage economic activities within unemployed and disadvantaged population. · Increase participation on local development initiatives. · Generate permanence and reduce migration problems from rural communities. · Encourage sense of pertinence and preservation of local culture and traditions from rural communities.	· Guarantee the proper and effective management of resources. · Guarantee the proper functioning of the local institutions and its representatives. · Guarantee the proper dialog and understanding of local actors (Rural communities, NGOs and private firms). · Represent properly the local interests in assemblies and dialog forums with central representatives. · Guarantee the proper follow-up, control measures and flow of information.
Development Agencies / NGOs	· Interact with different levels of government and private firms to generate the necessary networks and credibility. · Generate funding networks · Promote collective knowledge and represent local interests such as: Preservation of natural resources cultural heritage, social and economic development, etc.	· Guarantee a proper dialog and understanding of the needs and interests from local actors (Rural communities, private firms, and local governments). · Guarantee the proper and effective management of resources. · Guarantee the proper follow-up, control measures and flow of information. · Guarantee the proper functioning of its representatives.

Private Firms	• Develop and strength its supply chain of natural resources to ensure its sustainability through continuous operation and growth. • Develop strategic networks with NGOs, as well as with central and local governments to have access to incentives, specialized support and maximize resources. • Generate access to specialty and niche markets with value added competitive products. • Develop a positive social image and market recognition through responsible sourcing and social responsibility strategies with rural producers.	• Guarantee its own proper operation according to national regulations related to labour, environment, financial and fiscal responsibilities. • Participate actively in the dialog and gain understanding of needs and interests from local stakeholders (Rural communities, NGOs, and local governments). • Guarantee the proper and effective supply and management of resources. • Establish appropriate risk management strategies to participate in activities that go beyond their business core. • Guarantee an ethical behaviour based on responsible citizenship operational rules.
Members from Rural Communities	• Access to soft financing schemes for operation and capitalization of goods and infrastructure. • Increase participation and interaction with other institutions, improvement of its position in the decision making process. • Access to new technologies and skills sufficient to improve its products and the revenue generated from them. • Improvement of living conditions in services, education and infrastructure. • Access to global markets for their products. • Reduce migration problems and increase sense of pertinence of rural communities. • Preserve cultural heritage and regional traditions.	• Meet national regulations related to land property, environment, financial and fiscal responsibilities. • Guarantee the proper utilization and management of resources (natural, human and capital). • Participate actively in the dialogs, discussion and forums about the common improvement of their communities. • Participate actively and committedly in activities for auto-improvement and wellbeing (infrastructure, cooperatives, etc.). • Participate actively and committedly in trainings about skills and knowledge development to improve the added value of their products. • Respect committedly the common agreements established with the other actors.

Source: Analysis developed by authors based on theoretical research from Saraceno (1995); Ray (2000); Murdoch (2000); Bonal et al., 2003; Nemes (2005); Abramovay (2006); Manzanal (2006); Giessen and Böcher (2008); Dutrénit (2012).

As shown in table 2.2, the theoretical analysis identifies the type of motivational drivers and challenges that the different group of actors could experience when participating in IRD. In the case of central governments, for instance, the main motivation to be part of IRD strategies include to develop a mechanism to solve social problems related to poverty and disadvantaged situations; define an efficient distribution channel for central resources in order to reach the majority of the population; encourage economic activities; decentralize development initiatives; reduce dependency on central government; and

maximize benefit from central resources using other financial sources and partnerships with private capital. However, as identified in literature, central governments are subject to various challenges when participating in IRD. The challenges include developing the necessary flexibility to adjust policies, regulations and criteria according to regional socio-economic characteristics; adjusting resource management regulations to encourage economic development initiatives and entrepreneurship; guarantying the proper functioning of the institutions and its representatives; opening proper dialog channels for local institutions and private firms to discuss about joint strategies; and to guarantee the adequate follow-up, control measures and flow of information (Saraceno; 1995; Ray, 2000; Murdoch, 2000; Nemes, 2005; Giessen and Böcher, 2008; Giessen and Böcher, 2009; Dutrénit, 2012).

Each actor presented a list of motivations and challenges according to their role and interests. In the case of private firms, the main challenges include meeting national regulations related to labour, environment, financial and fiscal responsibilities; understanding the needs and interests of their local stakeholders (Rural communities, NGOs, and local governments); guarantying the adequate supply and management of resources; establishing the appropriate risk management strategies; getting involved in activities beyond their business scope; and guarantying an ethical behaviour based on responsible citizenship operational rules. Their main drivers rely on the development and strengthening of sustainable value chains, development of strategic links with civil and governmental institutions in order to have access to funding programs and incentives to maximize their resources, as well as to develop a positive image and generate additional socio-economic and environmental benefits through their Corporate Social Responsibility strategies (described in chapter 3).

2.2. Discussion

As observed in the literature, the main critics about the effectiveness of Integrated Rural Development were concentrated on: ensuring the proper institutionalization of the governance structure and decentralizing the control of development resources. Other complications were related to the proper integration of relevant partners like private firms to facilitate the generation of sufficient income sources (de Janvry, 1975; Lacroix, 1984; Cohen, 1989; Delgado, 1994). In Latin American countries, the social and economic conditions were different from those observed in the European cases. The main difference

relied on the fact that the poverty levels were significantly higher and mostly concentrated in rural areas (Cohen, 1989; Shucksmith et al., 1994; Delgado, 1994). According to the recommendations from successful empirical cases, for IRD projects to succeed in their venture to tackle poverty, the involved institutions should unravel possible challenges and ensure an efficient management of resources. Additionally they should guarantee proper operations; have committed participation from all actors to perform activities beyond their main scope; as well as to deal with problems related to information flows and use appropriate key performance indicators (Shucksmith et al., 1994; Shortfall and Shucksmith, 1998; Giessen and Böcher, 2008).

A crucial element for integrated rural development projects, as reported by literature, is the commitment of the involved actors (Midmore, 1998; Giessen and Böcher, 2008; Dutrénit, 2012). However, actors will only voluntarily participate if specific benefits are generated. These benefits do not necessarily have to be profits in material terms, but can also be related to personal development, community appreciation, preservation of cultural heritage and customs. According to the identified motivating factors and challenges from applied literature, the most dominant themes for the actors involved in IRD are resource maximization, the generation of wellbeing and creation of economic development. Given that in most cases the available resources - economic, human and technological - are limited and subject to different conditions, such maximization becomes critical to encourage the sufficient economic development to ensure the sustainability and self-sufficiency of rural communities, which in turn and as a desired outcome, would result in the generation of social wellbeing (Goldsmith, 1985; Giessen and Böcher, 2008; Shucksmith, 2010). IRD strategies provide the opportunity to solve poverty related problems, while generating sufficient wealth to encourage the active participation of relevant actors in sustainable business models and value chains (Giessen and Böcher, 2008).

Participation in IRD is quite a challenge for private firms, as they necessarily depend on material benefits while the tangible results obtained from IRD projects usually tend to take a long time and a lot of efforts, including secondary tasks for obtaining the “goal” (Giessen and Böcher, 2008). However two key motivating factors identified by private firms were: a positive social image and a multi-level network. In recent years, corporations’ social performance has been gaining more attention from consumers and markets, which in some cases rewards responsible and ethical initiatives and in others

tends to punish negative actions (Boulstridge and Carrigan, 2000). Organizations are expanding their responsibility for their products beyond their sales and delivery locations and extending corporate social responsibility along their value chain (Utting, 2005). Ethical behaviour and responsible sourcing is more frequently observed in corporations. Firms are getting involved in communitarian development initiatives and promoting integrated social strategies with institutions from different levels like NGO's and local representatives, in order to maximize its capabilities and available resources (Gross and Verma, 1977; Shortfall and Shucksmith, 1998; Giessen and Böcher, 2008).

2.3 Conclusions

The learnings from this chapter demonstrated that the effectiveness of integrated rural development relies on the proper functioning of institutions, proper management of resources and proper integration of relevant actors to foster their own socio-economic development. The intended objective of IRD is to foster rural development through win-win situations in which policymakers, local representatives, private capital and rural citizens are integrated in productive ventures that fulfil everyone's expectations and interest.

Based on the evaluated concepts, the key element for the success of integrated rural development projects relies on the proper identification of the motivating factor(s), which in turn, would encourage each actor to get actively involved in such initiatives. The observed benefits obtained in different cases from the applied literature led to considerate that IRD strategies represent a functional opportunity for improvement, once the differences are managed at the point that a general trade-off and agreement is accomplished by the involved actors. As commented, the identified motivating drivers and challenges will serve as a theoretical background for the analysis about integration of private firms in rural development through CSR strategies in chapter 3, and to complement the empirical analysis of the case study (chapters five to seven).

For the development of the literature review presented in this chapter, the authors looked for Latin American authors in order to include their perspective and complement the analysis about IRD. After a search about related terms like ´Integrated Rural Development'; '*Desarrollo Rural Integrado*'; '*Proyectos de Desarrollo Rural del Banco Mundial*' and '*Desarrollo Rural Multi-sectorial*', the search provided limited theoretical

literature from Latin American authors. This might be related to the fact that the IRD approach was encouraged and generally addressed by policy makers and scholars from developed countries. Additionally, other concepts like '*nueva ruralidad*' and '*desarrollo rural territorial*' which represent the state of the art of rural development theories in Latin America were explored in order to find a link with the integration of private firms in rural development. The analysis about the aforementioned theoretical frameworks provided a deep description of the political implications and reforms observed in Latin America in relation to rural development during the last decades (Schejtman and Berdegué, 2004; Abramovay, 2006; Manzanal, 2006). It was also possible to find empirical cases assessing the participation of strategic partners, including private firms (David et al., 2001; Edelmira and Norma, 2001; Bonal et al., 2003). The aforementioned publications complemented the empirical research work about possible drivers and challenges faced by private sector when participating in rural development.

Chapter 3: Corporate Social Responsibility strategies applied for Rural Development

Abstract

Corporate Social Responsibility has been recognized by policymakers and development specialists as a feasible driver for rural development. The present chapter explores both theoretically and empirically how firms involved in CSR provide development opportunities to rural communities. The research first evaluates the applied literature on the utilization of CSR by private firms and policymakers as a strategy to foster sustainable rural development. The empirical research analyses the CSR of 100 firms from a variety of industries, sizes and countries to determine the type of companies who are involved in rural development and the kind of strategies they deployed. Results from the empirical research show that although rural development strategies do not fit all types of companies, a significant number of firms from a variety of industries such as financial services, personal goods, telecommunications, chemicals, industrial equipment, oil equipment and tools, construction, support services and more, have engaged in CSR programs supporting rural communities. Firms appear to be interested in stimulating rural development and to receive the benefits from the process. This chapter also includes an exploration of the main challenges and constrains that firms encounter when encouraging rural development strategies through CSR. The information about the drivers and strategies of private firms participating in rural development through CSR generated in this chapter will serve as background to complement the empirical analysis presented in chapter five.

This chapter is based on:

Arato, M., Speelman, S. and Van Huylenbroeck, G. (2016), Corporate Social Responsibility Applied for Rural Development: An Empirical Analysis of Firms from the American Continent. Sustainability, 8, 102.

3.1. Introduction

During the last decades, the concept of CSR has evolved from the idea of firms meeting legal and ethical obligations with their employees, customers, suppliers and the closely related society, into a more pro-active role by getting involved in environmental and societal strategies, collaborating with governmental and civil institutions as well as with international organizations (Carroll, 1991; Martin, 2002; Blowfield and Frynas, 2005; Utting, 2005; Cruz, 2009; Carroll and Shabana, 2010; Archel et al., 2011; Ma, 2012; UN Global Compact, 2013, 2014). Along this line, contemporary development policy prescriptions and empirical literature place emphasis on the potential of CSR as facilitator of rural development (Blowfield and Frynas, 2005; Frynas, 2005; Narrod et al., 2009). Applied literature and policy makers advocate CSR as a main driver for private firms to support development of poor communities by promoting closer integration with poor rural producers (Frynas, 2005; Narrod et al., 2009) In the last decades, relevant efforts towards poverty remediation in rural areas through multi-sectorial collaboration have been encouraged by international organizations such as The World Bank and United Nations. These organizations have developed programs based on alliances and partnerships among actors from different sectors (governments, civil society, the private sector, and other relevant stakeholders) for the promotion of rural development (UNPPA, 2007; Rio+20 conference, 2012; Global Compact, 2014).

In literature, emphasis is placed on the integration of poor rural producers with private firms as a solution for rural development (Goldsmith, 1985; Saraceno, 1995; Ray, 2000; van den Heuvel et al., 2011), but in practice a significant number of constraints complicates such integration. For instance, the working relationship with small and medium scale rural producers, represents additional challenges for the chain stakeholders. To date, extensive theoretical and empirical research exists about the participation of private firms in rural development through multi-sectorial collaboration or other CSR related initiatives. Literature offers an exploration of the benefits of CSR such as the enhancement of companies' competitive advantage; increment of staff's morale; cost-reductions resulting from sustainable actions like increasing eco-efficiency, recycling, and waste management; as well as access to niche markets and social image improvement (Kell, 2003; Frynas, 2005; Kell, 2005; Utting, 2005;). Furthermore the misuse of CSR is explored, analysing cases where it has been used by firms as a way to enhance their (sometimes bad) reputation; as a response to pressures from NGOs or finally as a way to

generate customer loyalty and positive image without a real commitment to development (Richter et al., 2005; Blowfield and Frynas, 2005; Utting, 2005; Frynas, 2005; Narrod et al., 2009; Carroll and Shabana, 2010; Rasche and Gilbert, 2012).

However an overview and assessment of the type of strategies that could be applied by private firms in relation to rural development is lacking. This type of analysis could help firms to decide which strategies would best fit their interests and needs when engaging in CSR. This is relevant because with a broad concept like CSR, managers and scholars face a problem deciding upon the best strategies (Utting, 2005; Cruz, 2009; Archel et al., 2011). Moreover, firms are generally subject to specific budget and profit maximization challenges. Therefore actions related to CSR are expected to be performed within certain parameters and scopes according to a firms' objectives and business philosophy (Murray and Voguel, 1997). As such, the challenge related to CSR also relies on identifying and deciding which social causes and stakeholders should receive priority consideration in the decision-making process (Carroll, 1991; Hillman and Gerald, 2001; Carroll and Buchholtz, 2014). In an intention to provide managers, scholars, and stakeholders with such relevant information, the present chapter explores both theoretically and empirically how firms involved in CSR provide development opportunities to rural communities. The main objective from this research is to improve the current knowledge about the application of CSR for rural development. Looking at empirical case studies, it also tries to identify the critical conditions and activities that could facilitate (or hinder) the collaboration of private firms in rural development initiatives. The information generated in this research can serve as theoretical and empirical background for the analysis of the drivers of private firms participating in rural development, as described in chapter 5.

The research first evaluates applied literature about the utilization of CSR by private firms and policymakers as to foster sustainable rural development. Then empirical data from 100 firms from a variety of industries, sizes, and countries is analysed to determine the type of companies who are involved in rural development and the kind of activities they deploy. For this analysis firms were selected from the list of supporting companies of the United Nations Global Compact, which is a strategic policy initiative for businesses that are committed to align their operations and strategies with 10 globally accepted principles in the areas of human rights, labour, environment, and anti-corruption (Kell, 2003; Rasche and Gilbert, 2012; UN Global Compact, 2014). The UN Global Compact is a non-compulsory initiative, in which its supporting members deliberately decide to participate

and to report their performance through a periodical report known as Communication on Progress "CoP" (UN Global Compact, 2014). Every supporting firm is accountable for the reported information and the reliability depends on their integrity. Although no specific assessment is performed by UN officers, companies have external observers (customers, suppliers, and other stakeholders) which evaluate the accuracy (Boulstridge and Carrigan, 2000; Kell, 2003; Kell, 2005; Rasche and Gilbert, 2012).

The present chapter does not aim to judge or evaluate whether the intentions behind the analysed CSR strategies are negative or positive, neither to assess the accuracy of the reports (in terms of monetary transfer or beneficiaries). The focus is merely on the identification of the type of firms encouraging rural development; the similarities found in the encouraged strategies; the main characteristics of its implementation; joint collaboration and integration with multi-level institutions; as well as on the mechanisms of dialog with local representatives and members of the communities. In this way the paper offers information to decision-makers that can serve as a reference when designing CSR strategies.

For those companies involved in rural development oriented CSR initiatives, the empirical research identifies some of the main motives encouraging firms' participation, which include: securing the provision of labour and part of the necessary resources from the rural communities neighbouring their operation sites; managing potential risks through dialog and cooperation with local representatives; gaining a positive social image and recognition from specific groups (customers, industry associations, NGOs, or authorities); and, principally for agro-food and natural processing firms, developing small and independent rural producers to enhance the value chain. It was also found that there exists a similarity within the applied initiatives. The activities could be grouped according to their characteristics and scope, identifying activities related to: dialog and agreements with locals, provision of training and education, preservation of natural resources, actions related to health and nutrition, preservation of local culture and identity, provision of housing or communitarian infrastructure, as well as provision of roads and communication infrastructure.

3.2. Private firms involved in rural development through CSR

3.2.1 Benefits and challenges

The involvement of private firms is a key element to foster integrated rural development strategies. Companies participating in integrated value chains are expected to act as a strategic partner providing market opportunities for rural producers, as well as sharing with them technology, skills, and knowledge necessary for their improvement. The benefits from their participation, include continuous supply of their products; strengthening of their supply chain; positive market recognition; access to specific market niches and improvement of their position to manage the risks involved in the process (Goldsmith, 1985; Carroll, 1991; Saraceno, 1995; Martin, 2002; Ray, 2000; O'Connor and Meister, 2008; Archel et al., 2011; Arato et al., 2014). Moreover, companies whose value chains are not directly linked with rural communities (i.e. financial services, mobile telecommunications, manufacturing, construction, chemicals and others) might also have the opportunity to generate benefits through IRD. Through CSR and stakeholder management strategies, firms could manage possible risks and contribute to the improvement of socio-economic conditions from vicinity rural communities near to their manufacturing or administrative sites. The win-win proposition expressed by Utting (2005) recognizes that through the application of CSR strategies firms are able to receive different benefits like enhancement of company's competitive advantage, customer recognition, cost reduction by eco-efficiency and recycling as well as to increase personnel morale and reduction of labor turnover. However there are significant obstacles that must be faced by firms during their race to become better corporate citizens. For instance, companies undertaking costly initiatives could end up risking their price-cost competitiveness. Other obstacles related to multi-institutional interactions may result in bureaucracy and over-regulated processes representing resources and costs for companies without generating meaningful societal benefits in return – principally during the early stages of the process (Martin, 2002). To have a broader perspective table 3.1 summarizes the main benefits and challenges linked to CSR, as identified in literature.

Table 3.1. Benefits and Challenges of Corporate Social Responsibility.

Benefits	Challenges
- CSR generates positive effects in firm's work environment, human capital attraction and retention (Gross and Verma, 1977; Hemphill, 1997; Parket and Eilbirt, 1975; Martin, 2002).	- CSR demands additional knowledge and resources from companies by getting involved in social concepts and areas beyond their expertise (Freeman and Liedtka, 1991; Hemphill, 1997).
- The use of sustainability and CSR metrics helps decision-makers to set goals, gauge company's progress, benchmark competitiveness and compare alternatives of sustainable development (Székely and Knirsch, 2005; Kemp, 2012).	- Information about performance of Sustainability and CSR strategies should be organized and properly displayed in a format that best support the decision-making process (Murray and Vogel, 1997; Parket and Eilbirt, 1975; Székely and Knirsch, 2005).
- Access to economic incentives, favourable taxing and preferential trade and sourcing programs (Hemphill, 1997; Li, 2012)	- Firms usually must deal with bureaucratic procedures and regulations when interacting with governmental institutions (Freeman and Liedtka, 1991; Hemphill, 1997; Martin, 2002).
- Companies with positive social image and responsible sourcing strategies have access to global markets and specialty niches (Boulstridge and Carrigan, 2000; Li, 2012; Ma, 2012).	- Generally managers find difficulties to demonstrate tangible-economic benefits from CSR. Principally in the short-term period (Parket and Eilbirt, 1975; Cruz, 2009; Kemp, 2012).
- Stakeholder Dialog provides a way to personalize relationships with the company's interest groups. It provides useful analytical concepts for diagnosis and prioritization of interests and strategies (Carroll, 1991; Ma, 2012; Kemp, 2012).	- Companies must identify their key stakeholders and define budgets and strategies to meet their demands according to their capacity and market conditions (Carroll, 1991; Hemphill, 1997; Murray and Vogel, 1997).
- Sustainable strategies can generate cost-reductions from increasing eco-efficiency, recycling, and waste management (Li, 2012; Utting, 2005).	- Although consumers express willingness to make ethical purchases, it is not the most dominant criterion in their purchasing decision. Factors like price, quality and convenience are still the most dominant (Boulstridge and Carrigan, 2000).
- Risks to profits, market share, supply, environmental treads, and reputation can be managed through CSR (Cruz, 2009; Utting, 2005)	
- Firms can strength its value chain by applying responsible sourcing initiatives (Cruz, 2009; Utting, 2005).	

Source: Analysis developed by authors based on applied literature.

3.2.2 Identification of stakeholders and strategies

Business leaders consider the reputation of their firm to be a crucial element of organizational success. Reputation is believed to be a criterion in purchasing decisions, and to contribute to the sales of a product, while conversely, a bad reputation may even contribute to product rejection or avoidance by consumers and stakeholders (Boulstridge and Carrigan, 2000; Smith, 2003). As stated by Trapp (1998), consumers vote with their wallets for reputation of the companies. Currently, businesses are expected to be a good corporate citizen by contributing with financial and human resources to the community

and to improve their quality of life. Of course the main discourse for managers would lie in trade-offs between "concerns about profits" and "concerns about society" (Carroll, 1991).

Firms are generally subject to specific budgets and profit maximization strategies, therefore actions related to CSR are expected to being performed within certain parameters and scopes according to the firms' objectives and business philosophies (Murray and Voguel, 1997). Managers should be able to identify and decide which social causes and stakeholders should receive priority consideration in the decision-making process. As explained by Carroll (1991), the challenge of stakeholder management is to ensure that the firms' primary stakeholders achieve their objectives while other stakeholders are also considered and –if possible– satisfied. The concept of CSR implies different aims for different groups, while for one group it represents protecting the environment and society, to others it is all about paying greater attention to the interests of consumers and employees. In order to determine firm's very own aim and scope various authors (Naftalin, 1973; Carroll, 1991; Kell, 2003; Utting, 2005; Frynas, 2005; Giessen, 2009; Shucksmith, 2010; Ma, 2012) recommend managers that before getting involved in CSR strategies and rural development should answer the following questions:

- Who are the company's stakeholders?

- What are their stakes?

- What opportunities and challenges are presented by the company's stakeholders?

- What CSR obligations (economic, legal, ethical, and philanthropic) does the company has with its stakeholders?

- What strategies, actions, or decisions should the company take to best deal with these responsibilities?

Besides rural communities, there are other players benefitting from the participation of firms in rural development strategies. Governments and civil institutions are also favoured from the active participation of firms through CSR. Benefits like resources maximization, regularization of land tenancy, transparent operations, combat of poverty, solution of legal conflicts and other of socio-economic problems are some of the outcomes generated through corporate social responsibilities in rural areas (Saraceno,

1995; Ray, 2000; Murdoch, 2000; Nemes, 2005; Giessen and Böcher, 2008; Dutrénit et al., 2012). Since every actor is connected and interrelated, its active participation results relevant to overcome the difficulties and challenges faced by firms when participating in rural development, minimizing problems such as additional bureaucratic procedures, additional resources, difficulties to demonstrate tangible-economic benefits, among others (Woodward et al., 2001).

3.3. Empirical Research

The objective of the empirical research is to identify the motives, interests, and strategies applied by firms to collaborating in rural development through CSR initiatives. Given that the concept of CSR represents a variety of approaches, it would be very difficult to evaluate the different strategies deployed by the firms without a specific set of guidelines which would provide a sort of criterion to analyse their reported activities. Therefore the present research analyses the public-available information from a sample group of UN Global Compact 'UNGC' supporting companies. The analysed information was obtained from the companies' Communication on Progress CoP reports.

The present analysis includes companies from different countries of the American continent. This continent was chosen because it hosts around 25% of the supporting company members of the UN Global compact (more than 3000 firms). Furthermore it hosts the countries with the highest growth rates of supporting companies in the last years e.g. Argentina, Brazil, Colombia, Mexico, and the United States.

3.3.1 Methodology applied for the analysis of the empirical case study

The empirical analysis focused on a sample from the list of participating businesses from the UN Global Compact web site. The sample is composed of 100 firms belonging to all the listed industry sectors (i.e., Construction, Mining, Personal Goods, Financial Services, Chemicals, Beverages, Oil and Gas processing, Food Producers, General Industry, and Retail among others listed in Annex A). The pursued objective is to analyse: (a) the type of firms involved in some form of support to rural communities, as well as (b) to identify the kind of activities that they are encouraging.

To generate a representative sample, the selection process took several criteria into account. First, the number of companies selected per country was determined based on

the total number of companies from that country as listed in the UN Global Compact list of participant businesses (information consulted in January 2014). As shown in Table 3.2, the sample includes firms from: Brazil, Colombia, Mexico, United States, Argentina, Peru, Chile, Canada, Paraguay, Uruguay, Bolivia, and Venezuela. Secondly, company sizes (in terms of employees) were considered ensuring that the sample included: 25% of firms with less than 250 employees; 25% companies between 251 and 1000 employees; 25% firms between 1001 and 5000; and 25% transnational enterprises with more than 5001 employees. Third, the ownership type as listed by the Global Compact was considered. For instance, in the case of Brazil, as observed in Table 3.2, from the total supporting companies, 80% were privately owned, and 10% were publicly owned. Therefore in the Brazilian sample, which constitutes 20 companies, 16 privately owned and 2 public companies were included. State owned and "not specified" ownership types represented each around 5% of the total number of enlisted companies. Subsidiaries and FT-500 companies were not included in the sample because occurrence of these two types was significantly lower (less than 1%). Finally, years of experience with Global Compact was also taken into account, selecting companies with different levels of experience (with a minimum of two years). Also for this distribution the number of actual affiliations in a particular country for a particular year was used as weighting factor.

Table 3.2. Composition of weighted samples of companies according to its country of origin and type of ownership

Weighted sample - All industries							
Country	**Sample 100**	**Privately Owned**	**Publicly traded**	**FT-500**	**Subsidiaries**	**Not specified**	**State-Owned**
Brazil	20	16	2	-	-	1	1
Colombia	19	15	1	-	1	1	1
Mexico	18	15	2	-	-	1	-
United States	16	10	3	2	-	1	-
Argentina	10	7	1	-	1	1	-
Peru	5	3	1	-	1	-	-
Chile	4	3	-	-	-	1	-
Canada	3	2	1	-	-	-	-

Paraguay	2	1	-	-	-	1	-
Uruguay	1	1	-	-	-	-	-
Bolivia	1	1	-	-	-	-	-
Venezuela	1	1	-	-	-	-	-

To classify the type of activities that every company deployed to their particular stakeholders, first firms whose actions followed specific goals and objectives related to social, economic or environmental improvements of rural areas were defined as rural development supporters. In this case, the provided goods were generally under the form of credits or investments; and specific returns were expected from these investments besides generating improvements for the members of the rural communities. This is distinct from rural philanthropy. The present manuscript recognizes as rural philanthropy the type of economic transfers or in-kind donations to rural communities under the form of charity. The type of activities recognized by the authors as rural philanthropy were those provided sporadically without a specific goal or long term plan (usually time-specific donations for contingences). Although rural philanthropy is in fact a form of support to rural areas, these activities were not considered in the general analysis of this paper, mainly because of the lack of long term plan and continuity.

The information on the activities was obtained from the CoP of the selected companies. The information was processed manually in a data sheet where all the activities deployed by the selected companies were grouped according to the objective pursued by each of them. Although the reported activities were different from each other, there were similarities in purpose and expected outcome. Therefore, different groups of activities could be classified based on the aim. Activities were classified as: (i) dialog with locals; (ii) housing and infrastructure development; (iii) provision of training and education; (iv) encouragement of economic development and microcredits; (v) employment; (vi) health promotion; (vii) nutrition; (viii) preservation of cultural heritage; (ix) preservation of natural resources; as well as (x) development of roads and communication infrastructure. For instance, if a company performed interviews or applied surveys to their rural stakeholders, these activities were classified as “dialog with locals”. The same classification was applied for companies assigning an employee or committee to organize

focus groups, and to establish contact with local representatives (more detail in section 3.3.2).

3.3.2 Results from the empirical research

From the sample, 34% of the companies reported to have deployed rural development strategies. These companies come from a variety of industries such as: Personal Goods; Financial Services; Mobile Telecommunications; Chemicals; Industrial Equipment; Oil Equipment and Tools; Construction; General Retail; Nonlife Insurance; Support Services; Automobile; and Media.

Companies list their principal interests and the factors that motivate them to promote rural development. The most recurrent motivation, as reported in the CoPs, was to support socio-economic improvement of rural communities neighbouring their operation sites. Recognized by firms as primary stakeholders, neighbouring communities represent a particular interest for business managers, principally because they generally provide labour and part of the resources necessary for their operations. As a strategy to manage potential risks, firms expressed their interest to establish continuous and effective dialog with nearby communities to understand their needs and concerns, providing resources and communication with local representatives to jointly promote development strategies.

Another popular catalyst was to encourage social responsibility strategies with rural producers in order to gain positive social image and recognition from specific industry or market associations. In the latter, according to each industry or business model, firms reported to have obtained different certifications or validations for their production process, supply chain, business ethics, among others. Within the industry associations and Consumers groups evaluating responsible practices were found: IFFO global standards for Responsible Supply (IFFO, 2014); Extractive Industries Transparency Initiative (EITI, 2014); Starbucks C.A.F.E. (Starbucks, 2014); IFC's Good Practice for Strategic Community Investment (IFC, 2014); British Retail Consortium Global Standards (BRC, 2014); Sure Global Fair (SGF, 2014); among others.

A strategy principally reported by agro-food and natural resources processing firms, was to promote rural development for small and independent rural producers that belong to their value chain. As reported by the firms, these strategies facilitate the strengthening of their value chains, ensuring its continuous operation and growth. Another strategy,

reported by the evaluated companies was to promote rural development within rural producers providing capital, training or technology through responsible sourcing initiatives, Organic production, Ethic trade, and others in order to gain access to specialty and niche markets with value added competitive products.

To analyse the rural development strategies applied by the evaluated firms, the reported activities were segmented according to their scope, i.e.: Dialog and agreements with locals; Provision of training and education; Preservation of natural resources; Actions related to health; Encouragement of local culture and identity; Activities related to nutrition; Provision of housing or community infrastructure; and Provision of roads or communication infrastructure (displayed in figure 3.1).

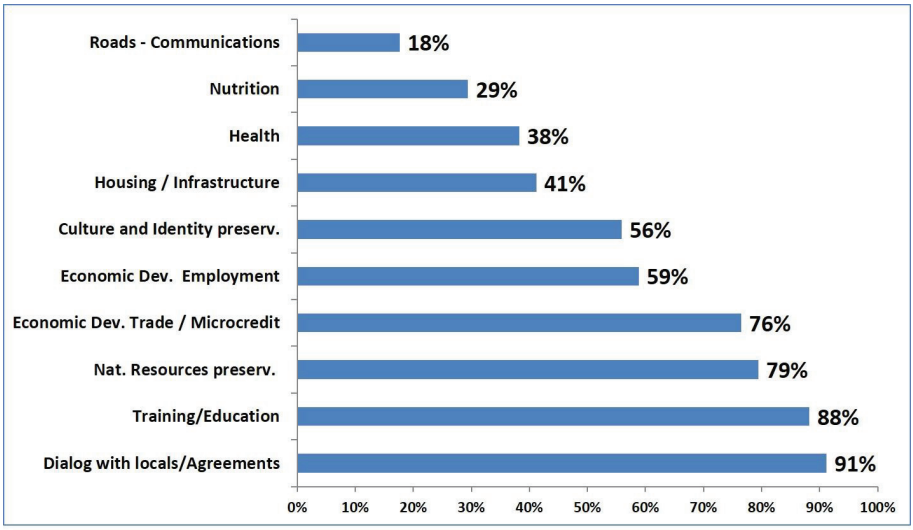

Figure 3.1. Rural Development Strategies applied by the analyzed companies.

Source: Calculated by authors based on the activities reported by the evaluated firms.

As observed in figure 3.1, companies encouraging rural development from both sample groups recognize the importance of dialog with rural communities. In both samples, firms reported to have established a sort of channel to facilitate communication and dialog with their respective rural stakeholders. Other popular activities undertaken by the analysed companies include providing training and education, economic development through microcredits or operating lending, promotion of natural resources preservation, and generation of employment opportunities.

3.3.3 Type of strategies for rural development

Taking a closer look at the type of rural development strategies deployed by the identified firms from both sample groups, the most popular strategies are related to encouraging dialog, providing training and education, as well as to encourage preservation of natural resources and protect the environment. The present section includes a closer look of each of these strategies.

3.3.3.1 Dialog with rural communities and local institutions

Most firms encouraging rural development promote participation of their employees with representatives from local neighbouring communities. As shown in table 3.3, the most popular dialog mechanism was the direct face-to-face communication with locals through interviews, surveys, communitarian assemblies or even open house events. The second most popular mechanism was the dialog through commercial relations in various forms such as “employer-employee”, “buyer-supplier” or “coach-entrepreneur” type. The later principally applied to companies encouraging entrepreneurship or by those whose supply chain includes rural producers and entrepreneurs. Another popular dialog strategy was performed through NGOs or specialized groups who represent the interest of locals.

From the identified companies encouraging Dialog as part of their Rural Development strategies, about half of them reported to have designated a directive, staff group or department oriented to manage the communication and dialog with stakeholders. This is the case for the U.S. Company Starbucks who reported the creation of the position Chief Community Officer “CCO”, whose main duties are related to lead their community, partner resources, government relations, diversity and global responsibility teams (Starbucks, 2012). Similar examples are observed in companies like Industria Agraria la Palma (2012), Holcim Colombia (2012) and Endesa (2012) from Colombia; Minera Yanacocha (2012) from Peru; Industrias Peñoles (2012), Fomento Económico Mexicano (2013) from Mexico; BRF Foods (2013) from Brazil; among others.

Within the efforts to foster constructive dialog and understanding of their stakeholders, companies described their strategies to enhance communication; this is e.g. the case for Fibria Celulose (2012) from Brazil, which describes its local community relationship model which includes four types of dialog:

1) "Engagement", in which the company assumes the role of partner in local development of the communities that are most affected by their operations.

2)"Operational Dialog", whereby local communities, other neighbours, and local government representatives are informed about local forestry operations and discuss about possible impacts and ways to mitigate them.

3)"Constructive Dialog", in which instruments of dialog are used to disseminate its activities and enabling the exchange of information with all stakeholders with an interest in the company's activities.

4) "Face to Face meetings", which consists in visits by Fimbria's representatives to communities that are not covered by engagement and operational dialogue, in order to understand the local situation.

3.3.3.2 Training / education

The second most popular strategy, as reported by the analysed companies, was to provide training and support education and training for peasants. As displayed in table 3.3, the most popular form of support on education was the provision of work and technical training, as well as safety and security training for employees. Most companies reported to have contracted labour force from neighbouring rural communities; therefore, besides work related technical training to their employees, they also organized training sessions for their families, transferring knowledge about household safety, domestic economy, cooking, as well as other practical workshops. Other popular strategies involved providing school supplies, scholarship or any other type of funding for students. A strategy also reported but by smaller number of companies due to the size of the required investment, was to provide infrastructure, materials or even the full construction of school facilities for their stakeholders at rural communities.

3.3.3.3 Natural resources preservation

A general awareness about environmental preservation and ecological consciousness was observed among the evaluated companies. Companies reported to have provided informative sessions and specific courses about ecological preservation to rural families. Other common measures observed were providing resources (both in terms of labour and materials) to support preservation and reforestation campaigns.

Some of the reported strategies involved the transfer of technology for environmental regeneration, such as water treatment stations, recycling infrastructure and land recovery. From the later, a close cooperation with governmental representatives at all levels (local and national) as well as the participation of NGOs was observed, principally because of the magnitude of the required budget and the amount of potential beneficiaries.

3.3.3.4 Infrastructure and economic development through entrepreneurship and employment

A common strategy to encourage entrepreneurship within the evaluated companies was to foster development through microcredits, as well as providing technology along with training and workshops to develop specific skills. This is e.g. the case for Indupalma (2012), which reported the creation of local businesses with neighbouring commoners. Similar examples were observed with Furnas Centrais (2012) and its projects to develop indigenous communities; Kablin (2012) and its strategies to promote rural development with neighbouring communities of its Montealegre Plant; The Rural Development Program from Fibria (2012), which aims to develop legitimate leadership, build social capital and restore a sense of citizenship and self-esteem; ENDESA (2012) and its community productive projects; Invesa (2012) and its "INTERACTUAR" program which considers the provision of training and resources to encourage entrepreneurship with locals; among many others reporting successful results.

In the case of the companies working with rural producers as part of their supply chain, most of the activities were oriented towards improving working conditions as well as to improve living conditions for the employees and their families in rural communities. For those companies working with independent producers, most of the activities were directed to providing technology and knowledge necessary to promote best practices, safety and security, increase efficiency rates, additional to contribute with resources to generate improvements in their communities.

A measure deployed by some companies, as shown in table 3.3, was to promote the active participation of government institutions, local representatives and civil institutions to collaborate in the generation of infrastructure necessary to improve the living conditions of local inhabitants from their interest areas. Examples of such infrastructure development projects were found in companies like Independence SA (2011), Energía Electrica del

Pacífico EPSA (2012), Yanacocha (2011), Pacific Rubiales (2012), and Pichichi Sugar Mills (2012), which encouraged joint projects with their respective stakeholders to build water treatment infrastructure for rural communities. Other infrastructure projects also identified included construction of schools, clinics, homes, roads and communitarian spaces.

3.3.3.5 Promotion of Culture, Health and Nutrition.

Firms reported their participation in communitarian events and fairs in a way to integrate with the society. Other forms of support reported by companies like Indupalma (2012), Peñoles (2012), Souza-Cruz (2012) and others, are grants for artistic activities and sport events.

Another form of integration and risk management, as reported by the evaluated companies, was the promotion of health and nutrition of the inhabitants of the nearby rural communities. A common measure deployed is to provide training and advice about best practices for nutrition and health; other measures also reported were the provision of brigades for medical check-up, medicines and meals for youngsters and elder population.

Table 3.3. Types of rural development strategies reported by the evaluated firms.

Type of strategies	Qty. of Firms
Dialog with locals/Agreements	**31**
Direct Dialog (Surveys, Communitarian assemblies)	23
Dialog One to One (Commercial or Working relation)	23
Dialog through NGOs and local institutions	23
Committee or Responsible for Dialog	18
Indirect Dialog (workshops or public events)	2
Training/Education	**30**
Work related and Technical Skills training	22
Security and Safety Education	22
Material Supply Scholarships and Funding for students	20
Schools Building or Infrastructure improvement	12
Nat. Resources preservation	**27**
Environment technical training to Rural population	21
Support in preservation and reforestation campaigns	17
Technology Supply / Other	13
Economic Dev. Trade / Microcredit	**26**
Training and Microcredit for entrepreneurship	16
Supply Chain Development	15
Economic Dev. Employment	**20**
Employment Permanent contract	19
Employment Temporary contract	6
Culture and Identity preservation	**19**
Promotion of local activities, sports and traditions	17
Support of local communitarian facilities	9
Housing / Infrastructure	**14**
Company + rural population involved in Construction	11
Provision of Materials	7
Credit	3
Health	**13**
Disease prevention Education	10
Medical brigades and check up	4
Medical Facilities (Construction or goods supply)	1
Nutrition	**10**
Nutrition related education	5
Supply of food goods	4
Brigades of Nutrition	3
Roads – Communications	**6**

Source: Calculated by authors based on the information reported by participants of the UN Global Compact to January 2014.

3.4. Discussion

On the topic of CSR, a polarized opinion is found among the general public regarding its real benefits and the reasons for firms to join. A line of literature concentrates on the improvement opportunity related to the reliability of the reported outcomes (Carroll, 1991; Cruz, 2009; Ma, 2012; Ahmed et al., 2014). Furthermore, empirical analyses have stressed the need of a common ground between governments, civil institutions, and private firms in order to improve regulations, transparency, reporting, measuring, and applicability of CSR (Utting, 2005; Frynas, 2005; Cruz, 2009; Narrod et al., 2009; Rasche and Gilbert, 2012; Celma et al., 2014). Other authors and supporters of CSR have looked at successful empirical cases and have explored the different benefits CSR can offer (Kell, 2003; Kell, 2005; Rasche and Gilbert, 2012; Ma, 2012; Ahmed et al., 2014). The intention of this research was to address a gap in literature about the possibilities of CSR for rural development. For actors convinced about the potential of CSR for rural areas, there is limited information available about the kind of activities and the lessons drawn by private firms that are actively implementing such practices.

The analysed information about corporate social responsibility explains how firms are expanding their responsibility for their products beyond their sales and delivery locations. As observed, some firms have been migrating from mere profit oriented economic entities to more socially and environmentally concerned organizations. They aim to serve the society while still generating profit to ensure their own sustainability (Kell, 2005; Utting 2005; Cruz, 2009; Carroll and Shabana, 2010). In line with the analysed literature the data showed how managers are taking the lead to encourage social responsible actions to support and benefit their primary stakeholders.

The results from the research showed that rural development oriented CSR programs are not only restricted to firms from the agro-food and natural resource processing industry. Companies from a variety of industries appear to be interested to stimulate rural development and to receive the benefits from the process. However, even though outcomes are mostly positive, rural development strategies might not suit all kind of companies. Managers should first evaluate their role in the society they serve and identify their key stakeholders (Bulstridge and Carrigan, 2000; Kell, 2003; Frynas, 2005; Blowfield and Frynas, 2005; Carroll and Shabana, 2010; Celma et al., 2014), after which they can engage in strategies according to their objectives, budget, and interests.

According to the literature, managers could find in CSR benefits such as maximizing profits, gaining access and recognition from markets, as well as to minimize environmental effects and potential risks (Frynas, 2005; Utting, 2005; Cruz, 2009; Celma et al. 2014; Ma, 2012). However, in the analysed CoPs, such benefits were not clearly expressed by the companies. Some of the most referred outcomes generated by CSR in rural areas included resource maximization, combatting poverty, and solutions for various socio-economic problems. At this point of the research, and due to its scope, it was not possible to determine specific economic benefits beyond the reported outcomes, although some of the companies indirectly refer to this, because of their current commercial relationships with their rural partners. In order to determine further benefits for private firms, it might be necessary to analyse the cases in more detail. This might be an interesting follow-up research.

As shown in Table 3.3, many firms appear to agree that stimulation of entrepreneurship or offering employment opportunities are positive measures to minimize risks and to contribute to improved living conditions and wellbeing of the rural communities. Within the communities it can also reduce the economic dependence on the firms' performance. As commented, in addition to rural communities, there are other players such as governments and civil institutions that benefit from the participation of firms in rural development strategies. To maximize the outcomes from CSR active multi-sectorial participation is relevant to overcome difficulties and challenges commonly faced by firms when participating in rural development and to increase resources. The evaluated firms report having received support from governmental institutions and NGOs to accomplish their projects. The main benefits from such multi-sectorial collaborations include the integration of different types of expertise such as social organization, natural resources preservation, public administration, and others.

This complements the business skills and technical knowledge of the private firms. Another benefit is the availability of financial support from development funds encouraged by governments and international organizations. Therefore, the active participation of complementary actors, if well organized, could facilitate private firms to participate in rural development through CSR strategies.

The empirical research furthermore described in general terms the motivations and concerns reported by the evaluated firms. It also categorized the type of activities

deployed. Limited details were provided about the specific actions or projects encouraged by the analysed firms, mainly because this is very context specific.

Nevertheless, the literature review and the information obtained from the empirical research demonstrated some important facts to be considered by firms interested to participate in rural development oriented CSR initiatives to support one of their primary stakeholders:

- Importance of dialog with stakeholders: A key factor to consider is to establish channels for dialog with interest groups and development allies. Proper communication and understanding of community concerns facilitates the integration process and enables the maximization of available resources by tackling specific needs (Freeman and Liedtka, 1991; Martin, 2002; Kemp, 2012). As reported by the analysed companies, a popular measure was to establish mechanisms to facilitate dialog, reporting significant results for integration with local communities.

- The involvement and management of rural development: A key element to ensure positive results in rural development strategies is the involvement of top management and executives in order and to motivate their teams and provide the necessary resources (Parket and Eilbirt, 1975; Cruz, 2009; Kemp, 2012). As reported by the evaluated firms, a common way to facilitate the proper management of CSR related strategies is delegating its follow-up and operation to a specific person or group of persons (depending to a great extent on the resources and time available). In the case of SMEs, the activities were generally developed by the owner or founder to guarantee the efficient use of invested resources.

- The benefits of multi-institutional cooperation: An ideal measure to maximize resources and increase the scope of development projects is through cooperation with key stakeholders like governments and civil institutions (Hemphill, 1997; Li, 2012; Ma, 2012; Sharmin et al., 2014). As reported by the analysed firms, multi-institutional interaction benefited companies by enabling access to governmental incentives, as well as to advisory services from rural development specialists and NGOs which facilitated the effective and efficient use of available resources.

- To act local and to start with small projects: The number of beneficiaries and size of projects depends mainly on the available budget and the institutions involved. However,

as expressed by the analysed companies, in order to ensure positive outcomes, it is necessary to keep a close follow up and management of the deployed activities. Due to stakeholders having limited available resources, we recommended breaking down the intended development projects in different stages, in which the first stages include a reduced number of beneficiaries, to measure the performance and to learn during the implementation process in order to improve the implementation in the subsequent stages.

The present research is, however, also limited in some ways. It included companies from different countries from the American continent, but outcomes might have been different, if for instance, it was performed on countries from other regions like Europe, Asia, or Africa. Similarly, the focus was not really on comparing firms with different sizes (e.g., SMEs and multinationals). This type of further research and comparisons could complement the current knowledge about the application of rural development oriented CSR.

3.5. Conclusion

Corporate Social Responsibility is regarded as a feasible driver for rural development. The information in this chapter showed how companies are collaborating to foster the socio-economic improvement of their rural stakeholders. Although focusing on rural development probably is not relevant for all types of companies, managers interested in supporting rural development through CSR initiatives could use the identified activities as a reference when designing their own strategies, considering of course, their particular case and needs. The above described CSR activities and its application by the private firm from the analysed empirical case study are analysed in in chapter five.

For the rest of the companies, the challenge for the future is to encourage a higher participation on Rural Development, which for some cases would represent investing in groups that are not-directly linked to their operations, but that share common interests in land and society.

Chapter 4: Description of the case study area and supply chain: Candelilla wax from the Chihuahuan Desert in Mexico

Abstract

The promotion of development projects based on the commercialization of non-timber forest products has increased in recent decades, showing a positive contribution to rural development. This chapter examines the case of candelilla wax from the Chihuahuan Desert in northern Mexico. The candelilla wax business has been selected in this dissertation as the empirical case study used to test the effects of IRD strategies in sustainable development. This chapter identifies the potential contribution of candelilla wax in poverty alleviation of marginal areas, and its unique opportunity to access potential markets for a wide variety of industries all around the world. The analysis of the empirical case is based on three main aspects: social, economic and environmental. The present chapter also includes the analysis of the potential benefits that could be obtained from the collaboration between private institutions, development organizations, policymakers and rural producers through integrated rural development projects.

This chapter is based on:

Arato, M., Speelman, S. and Van Huylenbroeck, G. (2014), the contribution of non-timber forest products towards sustainable rural development: The case of candelilla wax from the Chihuahuan Desert in Mexico. Natural Resources Forum (Vol. 38, No. 2, pp. 141-153).doi: 10.1111/1477-8947.12043

4.1. Introduction

Around the world, the commercialization of non-timber forest products (NTFP) is regarded as an important contributor to rural development, providing income sources and generating better living conditions for poor farmers (Arnold and Ruiz Pérez, 1998; Fisher and Dechaineaux, 1998; Belcher et al., 2005; Marshall et al., 2006; Belcher and Schreckenberg, 2007; Syampungani et al., 2009). However there is controversy about these benefits for rural development and about the management of natural resources, as improper and uncontrolled exploitation may cause severe damage to ecosystems (Sheil and Wunder, 2002; Belcher et al., 2005; Bromley, 2005).

In Mexico the commercialization of NTFP represents an important income contributor for rural families, principally for those that live in arid regions. For them, harvesting NTFP is their main job since there are limited opportunities for agriculture and other economic activities (Marshall *et al*., 2006). Considering the different opinions about the commercialization of NTFPs, this chapter analyses the case of candelilla wax in the Chihuahuan Desert in northern Mexico. Candelilla is an interesting case not only because of its potential contribution to poverty alleviation in marginal areas, but because its unique potential to access markets for a wide variety of industries worldwide. The potential market demand of candelilla wax could be at least ten times higher than the current sales figures which already were above US$ 7 million in 2010.[4.1]

The wild collection of candelilla (*Euphorbia antisyphilitica*) in Mexico takes place in the states of Durango, Zacatecas, Chihuahua, Nuevo León, San Luis Potosí, and Coahuila. The extraction of candelilla currently represents a main source of income for about 3,000 families (Multiceras, 2012). Well trained collectors usually pull out plants by hand, harvesting the entire aboveground parts of the plants. The collectors transport the plants in bundles, principally on the back of mules, to the processing sites where sufficient water supply for processing is found (Barsch, 2004; Schneider, 2009). In the first stage of processing, which is done in the local communities, the plant material is boiled, obtaining the wax in its simplest non purified form, called *cerote*. This product then moves along

4.1 Calculated by authors with secondary data obtained from the United Nations Commodity Trade Statistics Database 2012, considering the market values of substitute products like Carnauba wax from Brazil and Palm wax.

the supply chain increasing in added value, as provided by the different actors of later stages from the value chain.

In order to understand the facts and constraints related to the utilization of candelilla, the analysis considers three main aspects: social, economic and environmental. The research also identifies the main actors and analyse their roles and interactions, addressing two main research questions: (1) How does the commercialization of candelilla wax currently contribute to the rural development of the producing communities?; and (2) How can the activity be improved so that more communities in the Chihuahuan Desert could partake in it? The information presented in this article yields insight into the sustainability of this specific case and identifies the potential benefits that could be obtained from collaborations between private institutions, development organizations, policymakers, and rural producers in integrated rural development projects. The candelilla wax business analysed in this chapter represents the empirical case study selected to test the effects of integrated rural development.

4.2. Methodology

This study relies on both primary and secondary data from official sources. A brief description of NTFP in Mexico is given as background, after which the socio-economic status of rural communities in the Chihuhuan Desert is evaluated. For this purpose, data was used from INEGI (Instituto Nacional de Estadística y Geografía) the Mexican institute responsible for the census, and from the Registro Agrario Nacional which is the institute responsible for the control of land tenancy and communal land. The poverty levels in the rural communities were analysed based on data from CONEVAL (Consejo Nacional de Evaluación de la Política de Desarrollo Social) which is a decentralized institute from the federal Government that is responsible for the evaluation of the Mexican public policies of social development and for the definition of the criteria for the identification and measurement of poverty in Mexico with the support of national and international academics. Based on their data, poverty levels are calculated and compared at the national, state and territorial levels. For the territorial level, the communities with less than 2,500 inhabitants whose main economic activity is related to the utilization of natural resources were selected from the general list of municipalities.

In section 4.4.1 the candelilla wax value chain is analysed, including an identification of the major actors and their roles along the supply chain. Primary data was collected for this purpose during the year 2011 and in July and August 2012, through semi-structured interviews with more than 150 *candelilleros* and collectors from 50 rural communities of the Chihuahuan Desert region. Members of private firms, government officials from CONAFOR, CONABIO, FIRA and SEMARNAT and officials of the local authorities from the states that compose the territory of the Chihuahuan Desert were also interviewed (Coahuila, Nuevo León, Chihuahua, Zacatecas, Durango and San Luis Potosí). The social, economic and environmental aspects of candelilla harvesting are considered, as well as the natural regeneration of candelilla plant. Section 5 discusses public and private projects and efforts for rural development and section 6 concludes.

4.3. Case study background

4.3.1 Non-timber forest products in Mexico

4.3.1.1 Legal framework regulating non-timber forest products in Mexico

During the last decade, public policies on biodiversity conservation and utilization based on ecological criteria, have allowed for the improvement of resource conservation in Mexico (CONABIO, 2006; INIFAP, 2011). In 2003, the Government issued the Ley General de Desarrollo Forestal Sustentable (LGDFS) [General Law for sustainable development of forest], aiming to regulate and enhance the protection, preservation, production, management, farming and utilization of Mexico's ecosystems and natural resources. The law defines the roles and responsibilities of government environmental agencies according to their particular expertise and area of action. Also the LGDFS includes the development and the application of the Normas Oficiales Mexicanas (NOM) [Mexican Official Norms] which are the regulations that contain the specifications, requirements, procedures and parameters of preservation and utilization targets, which need to be respected when developing commercial activities with natural resources.

The government agency responsible for the regulation, promotion and control of the commercialization and preservation of natural resources is the Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT) has different agencies who focus on particular objectives such as the Comisión Nacional Forestal (CONAFOR) which promotes sustainable forestry development and who enhances the conservation and

restoration of Mexico's natural resources. This agency is also responsible for the administration of utilization permits for the harvesting and commercialization of wild forest resources, and it provides different economic funds and support services to the rural communities. Another agency that belongs to SEMARNAT is called Procuraduría Federal de Protección al Ambiente (PROFEPA). This agency is responsible for ensuring environmental justice using law enforcement. It controls the proper utilization of natural resources in general.

In the past years the Mexican Government has thus clearly made progress in setting up a defined structure and mechanisms to manage natural resources. Currently, it is possible for environmental agencies to control the proper utilization of the natural capital and to develop preservation campaigns to promote sustainable commercialization. There is still some room for improvement concerning the accuracy of the reports regarding the production and commercialization of natural resources, as addressed by Tapia-Tapia and Reyes-Chilpa (2008). Additionally, enhancements are required on human and financial resources for the part of law enforcement, in order to prevent the improper utilization of natural capital (CONABIO, 2006).

4.3.1.2 NTFP from Mexico's arid region and the Chihuahuan Desert

The Chihuahuan Desert, is located in the northern to north-eastern part of Mexico. It is an arid and semi-arid territory that extends over 450,000 km^2 in the northern Mexican states of Chihuahua, Coahuila, Durango, Nuevo León, San Luis Potosí and Zacatecas (Candelilla Institute, 2012). The area includes also part of the United States (Arizona, Texas and New Mexico). This territory is rich in biodiversity, hosting more than 1,000 species of flora and fauna (CONABIO, 2008).

The main commercial NTFPs from the Chihuahuan Desert are derived from small bushes including, for example, Candelilla (*Euphorbia antisyphilitica*), Lechuguilla (*Agave lechuguilla torr.*), Oregano (*Lippia graveolens*), and Nopal (*Opuntina spp.*), along with different kind of seasonal fruits and plants.

4.3.1.3 Utilization permits for NTFP commercialization in the arid region

The use and trade of natural resources available on the communal land or *ejido* is regulated by utilization permits. The permits are provided to the rural producers after a

certified technician performs an evaluation, which includes the analysis of the composition of the natural capital suitable for commercial purposes and the definition of exploitation targets for defined periods (CONAFOR, 2012). This mechanism serves as a control measure to ensure the proper commercialization of natural products; prosecute its illegal exploitation (PROFEPA 2012); and to keep track of the natural capital stock and establish preservation strategies to ensure sustainable resource management.

4.3.2 Socioeconomic characteristics of the rural communities from the Chihuahuan Desert

4.3.2.1 Location and composition of rural communities

In Mexico, the most typical form of land property in rural communities is the *ejido*, which is an extension of land provided to a group of owners known as *ejidatarios* who are entitled to exploit the resources from this land, and to perform agricultural activities in their small properties within the limits of a given territory. This is based on the Political Constitution of the Mexican United States (Art. 27) and the internal regulations of the communitarian assembly.

The majority of the *ejidos* in the arid region are composed of different types of property. There is the common territory which in most cases corresponds to large extensions of land where the collection and harvesting of NTFP is performed, and there are private properties used principally for small farming activities and rural settlement areas. The majority of the rural inhabitants live in such settlements and most of the amenities present within the community such as elementary schools (in some cases secondary), rural shops and religious facilities are located there. Most rural communities from the Chihuahuan Desert are small clusters containing an average of 250-350 families living in isolated locations with limited access and communication with major cities and with each other. In the Chihuahuan Desert, more than 438,000 *ejidatarios* are registered. Of these, 71% are adults older than 50 years and just 0.5% are adults younger than 25. The rural families have an average of 3-5 members, and in some cases, young couples with small children are sharing part of the homes with elder adults such as parents or relatives (PHINA Rural Census, 2012; INEGI, 2010).

4.3.2.2 Income earning activities in the Chihuahuan Desert

There are limited sources of income for rural inhabitants from this region due to the isolated location and the limited access to major cities. The lack of paved roads hinders the grown of nascent commercial or industrial activities (CONABIO, 2009). Additionally the average education level of the rural adults corresponds to the first six years of elementary education or lower, a situation that excludes them from opportunities for better jobs for which more skills are required. For most rural families, the collection of local NTFP, combined with some complementary farming activities, represents their main source of income. Another source of income is the economic support provided by the Government via development programs such as Oportunidades and PESA Mexico, which contribute to the total family income (see section 4.4.2.3).

Most of the collection activities performed by farmers correspond to seasonal labor. In most cases, several NTFP are collected according to the availability of the resource. The most stable activities are the collection and processing of candelilla (*Euphorbia antisyphilitica*) and Lechuguilla (*Agave lechuguilla torr.*).

The collection and utilization of Lechuguilla is performed by many households in the region. The activity is regulated by SEMARNAT through the Mexican Official Norm NOM-008-SEMARNAT-1996, and as highlighted by Pando-Moreno *et al*. (2004), CONAFOR (2008) and Pando-Moreno *et al*. (2008), it is an income contributor for rural families. Although this activity's potential contribution to rural development is recognized, the present dissertation does not concentrate on this activity. The commercialization of the second species, candelilla, is also regulated by SEMARNAT through its Mexican Official Norm NOM-018-SEMARNAT-1999. It is performed mainly by male adult members of the family with sporadic support from the women. It consists in the collection of the plant from its wild environment and the processing to extract a product known as *cerote*, which is transformed into candelilla wax after a refining process which will be explained in more detail in section four.

4.3.2.3 Poverty in the rural communities of the Chihuahuan Desert

In addition to food and income poverty, other dimensions can measure the poverty levels of a community. In Mexico in 2010, 34.9% of the population was in a condition of relative poverty; and 11.4% lived in extreme poverty. Analysing the communities located in the

territory of the Chihuahuan Desert, 10.4% of the population was found to live in extreme poverty (CONEVAL, 2012). Figure 4.1 shows the comparison between the national mean versus the average of the communities in the Chihuahuan Desert for the different poverty dimensions measured by CONEVAL.

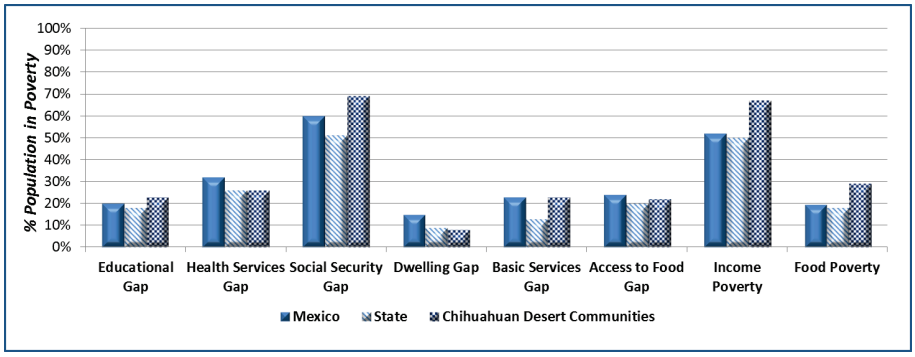

Figure 4.1. Comparison of poverty dimensions in Mexico, northern states and Chihuahuan Desert communities

Source: Calculated with secondary data obtained from CONEVAL, August 2012. For Chinuahuan desert, the authors considered small communities with less than 2500 inhabitants whose main activity is related to small farming and commercialization of natural resources.

Compared to the country mean, the Chihuahuan Desert has a larger percentage of the population suffering from poverty in most of the dimensions, principally in the areas of Social Security Services, Income and Food Poverty.

4.4. Results

4.4.1 Candelilla wax's value chain

Candelilla wax has been used for commercial purposes for more than a hundred years in a broad variety of applications in different industries due to its interesting characteristics such as its high melting point, hardness, brightness, protective properties, mold-ability, and low electrical resistance, among others (Hodge and Sineath, 1956; Canales *et al*., 2006). The present analysis of the value chain is based on the information collected during a period of field work in the producing areas. This section is divided in three parts capturing different stages of the chain: rural logistics, local logistics, and international

logistics. At each stage, the different actors with their roles and interactions are identified, as shown in Figure 4.2.

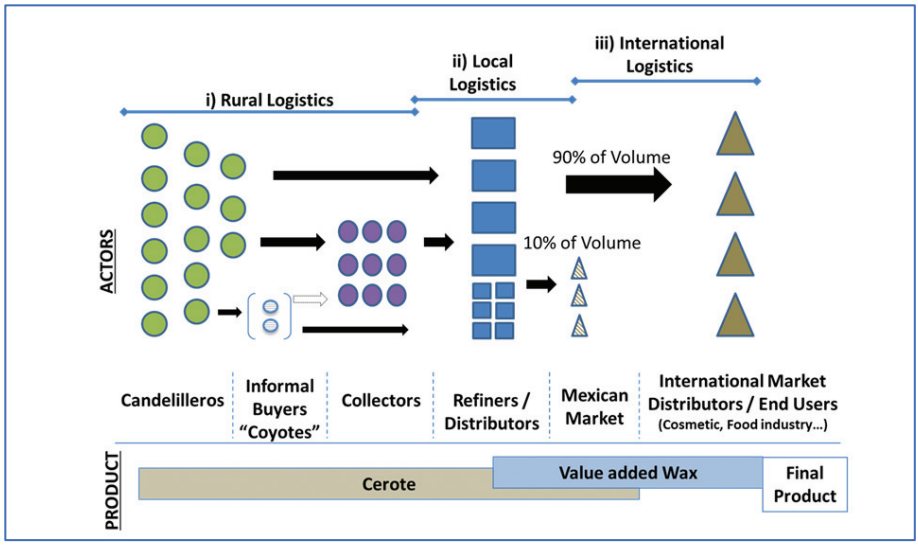

Figure 4.2. Candelilla wax's value chain diagram

Source: Authors' elaboration based on interviews and field work at the area.

4.4.1.1 Rural logistics

This stage begins with the rural producers, known as *candelilleros*, who harvest the candelilla plant and process it to obtain the wax under the form of *cerote*, which is the candelilla wax in its simplest form. The most common trade channel for *cerote* in rural areas is through the collectors, who are persons located in the rural communities who generally work for a refinery on a commission basis. In some communities where the activity is higher, it is common to find more than one collector, with each representing a different refinery. Another common trade channel consists of selling directly to the refiners that have purchasing routes, and who regularly visit the rural communities to buy *cerote* from *candelilleros*.

There are no official figures for the volume traded directly to the refineries or to collectors but, as observed during fieldwork, both channels are significantly higher than the volume traded through the "*coyotes*" (as typically known by locals) who are informal buyers that

visit the communities sporadically and negotiate the purchase of *cerote* directly with the *candelilleros*, most often with those *candelilleros* from the most isolated areas not situated on a refinery purchasing route, where living conditions are more difficult and where there is no collector. The *coyotes* are not well perceived by the locals (Schneider, 2009), because they usually purchase intermittently at varying prices and, unlike the refineries, do not provide any equipment or supplies for the processing.

This stage does not create much added value since it consists trading a wax in its most simple form. However, some efforts to provide value to the product are reported from a group of *candelilleros* from the region of Cuatrocienegas, Coahuila, with limited results to date. (CONAFOR, 2008).

4.4.1.2 Local logistics

The stage of local logistics comprises the purchase of *cerote* from the *candelilleros* and/or collectors, the refining process, and the delivery of candelilla wax to end users in the case of the Mexican market or to the port of shipping to international markets. In terms of competency and market share, more than 80% of the produced wax is concentrated in the hands of four large refineries; the rest is traded by small distributors and refiners that commercialize the product principally in the national market, some of them in the form of semi-refined wax with low added value (CONABIO, 2009; Schneider, 2009).

4.4.1.3 International logistics

International customers — principally specialist wholesale distributors that source the wax from the Mexican refiners and trade it to end users — represent 90% of the total market volume for candelilla wax; top consumers are countries like United States, Germany, France and Japan (CONAFOR, 2008; UNComtrade, 2012).The remainder is composed of a small number of large scale end users importing directly from the refineries in Mexico. The principal application of the product is related to the printing, cosmetic and food industries but there the wax has a broad variety of applications such as adhesives, polishes (such as shines), electrical insulation, crayons, pharmaceutical products, waterproofing (Candelilla Institute, 2012).

4.4.2 Candelilla wax production

4.4.2.1 Historical production volume of candelilla wax

Analysing the production history of candelilla wax in Mexico during the last 60 years, it could be observed that the production volume has decreased considerably. As explained further in this section, this is not caused by a reduction in the availability of the resource but by a lack of rural labor to process it. In order to identify the possible causes of this decrement, it is important to analyse the political and socioeconomic events that have affected the activity during this time period (see figure 4.3).

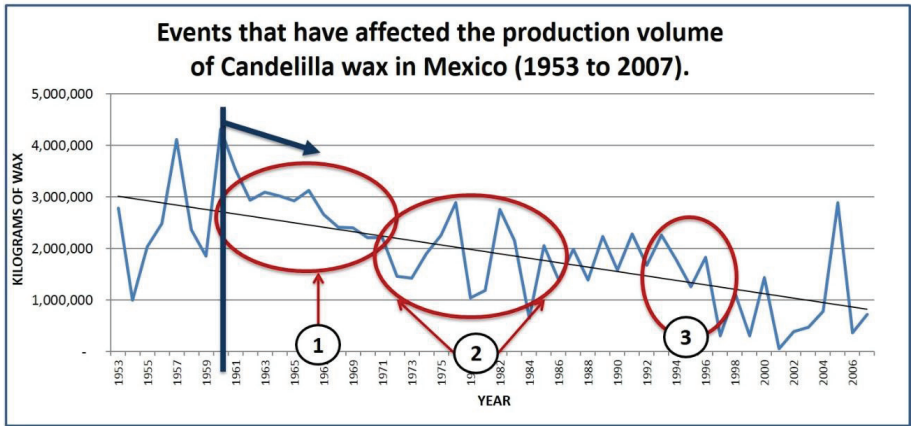

Figure 4.3. Events that have affected the production volume of candelilla wax in Mexico, 1953 to 2007.

Note: Production amounts are in kilograms; highlighted events are displayed on the chart for illustrative purposes. All references are mentioned in the corresponding segment of the text 1: Periods of migration from rural areas; 2: Period of general conditions of inequality and limited incentives for rural activities; 3: Period of uncertainty on the production of candelilla wax due to economic liberalization policies and new trade regulations and substitution of candelilla wax with other cost-competitive wax products in low specialty applications.

Source: Authors' calculations based on data from INEGI.

A trend affecting the activity is migration from rural areas (Figure 4.3, period 1). A lack of incentives and capital to encourage the development of the rural sector has been experienced during recent decades in Mexico. Inefficient policies and a significant economic crisis (Calva, 1999; Bromley and Perrotini, 2011; Kehoe and Meza, 2012) have resulted in the low competitiveness of agricultural products, principally because most

rural activities are currently performed in conditions of extensive labour with low technology. The effects of these problems are reflected in the high levels of poverty present in this part of the country. This forced many people in these areas to migrate from their communities to pursue better living conditions in larger cities or abroad.

A more significant reduction in production started in the 1970's concurrent with the country's general conditions of inequality and limited incentives for rural activities (Bazdresch and Levy, 1991; Alix-Garcia, 2011). This discouraged many rural producers from continuing to operate (Figure 4.3, period 2*)*, increasing out migration from the most marginal communities. It can be noticed in Figure 4.4 that by 1974 the total production level of candelilla wax in the Chihuahuan Desert was 37% lower than the volume reported ten years earlier.

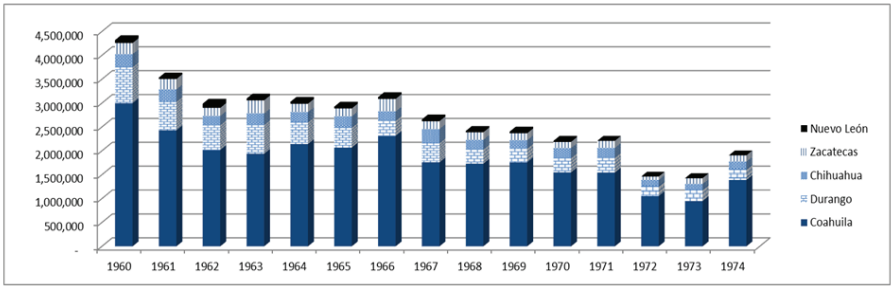

Figure 4.4. Candelilla wax production by states from the Chihuahuan Desert 1960-1974.

Note: Amounts in kilograms.
Source: Authors' calculation from secondary data obtained from INEGI, Anuario Estadístico de los Estados Unidos Mexicanos for the years 1960 to1974.

The production activity of candelilla wax has been concentrated in the state of Coahuila, where the largest amount of *candelilleros* are concentrated. Even though there are other states that have reported important production volumes in the past, such as Durango, Zacatecas and Chihuahua (INEGI, 1953 to 2010), their current production rate is considerably lower than their historical rates. Based on interviews with farmers from ancient candelilla wax producing communities, some young people claimed not to be familiar with the process, and others declared to know about the product because of their parents or grandparents who were used to produce it.

With the different economic reforms applied by the Mexican Government in early 1990's (Sanchez, 2004; Richter *et al*., 2005) the commercialization of candelilla wax and the rest

of the NTFP and natural resources was liberalized, allowing private firms to trade directly with the *candelilleros*. The economic reform and the entrance of different players into the market created a temporal sense of uncertainty within the rural population to the extent that some decided to stop producing or to migrate from their communities (figure 4.3, period 3).

Figure 4.3 shows a peak in production volume (around 3000 Tons) for the year 2005. This peak represents an isolated event that does not correspond to the long term trend in reported volumes. Furthermore there is no documented reason for this peak.

The applications for candelilla wax have been decreasing since the 1940's, principally because of substitution by other wax products in less specialty applications. Due to its characteristics, candelilla wax was used in a broad variety of applications, but because of its lack of competitiveness resulting from its rudimentary processing and limited supply volumes (Canales *et al*., 2006; Ochoa-Reyes *et al*., 2010), it is more costly compared to other wax products such as paraffin, vegetable (palm) wax, and carnauba wax, which benefit from economies of scale. For that reason, candelilla wax is positioned now in a niche market for high specialty products such as cosmetics, pharmaceuticals, precision casting, thermal printing and food. Figure 4.5 shows the number of different applications for candelilla wax in the US market during the last hundred years and the introduction of substitutes to meet the increasing demand for wax products.

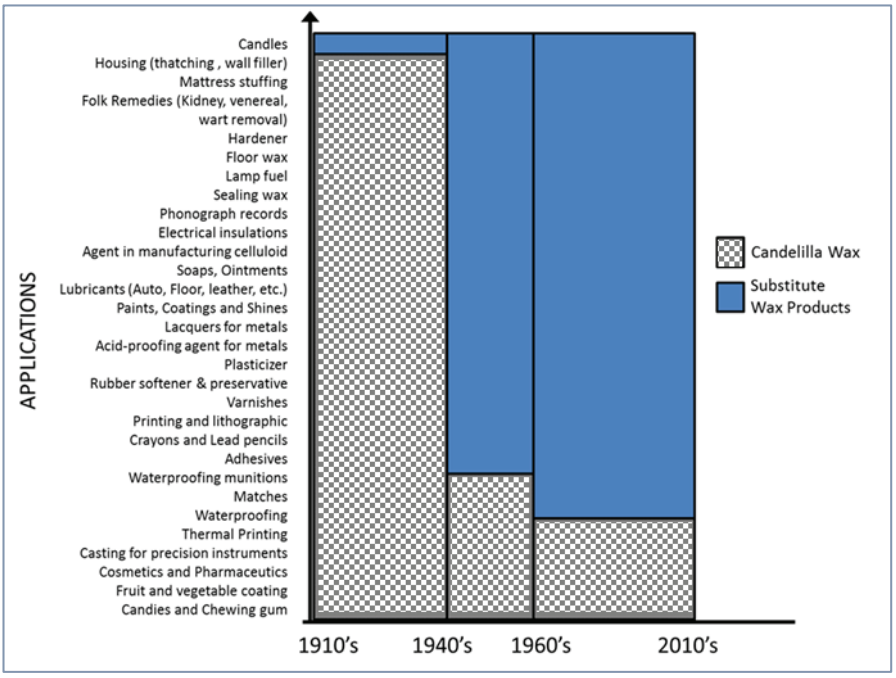

Figure 4.5. Application of wax products.

Note: This chart displays different applications for wax. It does not express production or trade volumes.
Source: www.texasbeyondhistory.net/waxcamps/index.html.

4.4.2.2 Cost allocation of candelilla wax's value chain

When analysing a value chain it is important to understand the cost allocation throughout the whole process, otherwise wrong judgments about the profit distribution can be made. A linear comparison between the prices paid to the *candelilleros* for the low value added product *cerote* versus the price paid by the end user for the final product might generate a wrong idea, because the gap doesn't reflect total profit for the distributor. In order to have a realistic perspective, it is necessary to consider all the costs incurred in the process (Jensen, 2008; Jalilova *et al*., 2012). Figure 4.6 displays an estimation of the cost distribution by each actor throughout the whole value chain.

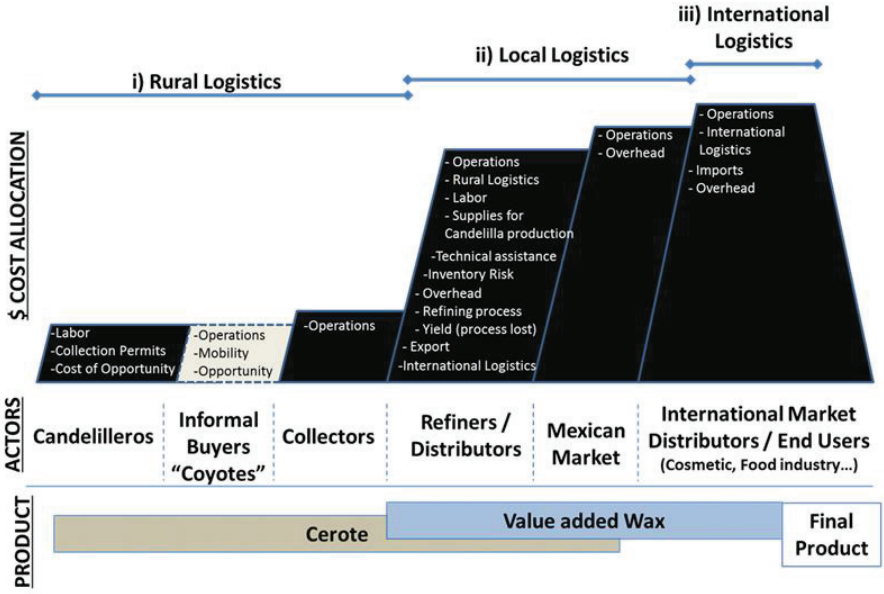

Figure 4.6. Cost allocation chart – Candelilla wax's value chain.

Source: Authors' elaboration from primary data obtained from surveys and interviews during fieldwork.

Whereas for *candelilleros* the main costs are their own labor, that can be estimated as the opportunity cost in comparison to the cost of performing a different activity on the one hand and the cost of the collection permits (that usually are fully or partially sponsored by governmental institutions or private companies) on the other, a larger scale of costs are observed on the institutional side of the value chain, finding concepts like operation costs, rural logistics, labor, insurances, supplies, technical assistance, export costs and so on (Foudjem-Tita *et al*., 2011; Kar and Jacobson, 2012). As observed in the lower part of figure 4.6, the more value added to the product, the more costs are applied, generating price increments and reducing the profit margins. What compensates for the profit gap is the traded volume. Whereas the *candelilleros* trade 100 to 120 Kg per month, refineries and distributors trade hundreds of tons (CONABIO, 2009; Multiceras, 2012). In the discussion part of this section, the opportunity that represents the economies of scale for this product is addressed.

4.4.2.3 Rural family income generated by candelilla commercialization

In order to gather insight into the commercialization process and to learn more about the 3,000 families that produce candelilla wax in the Chihuahuan Desert, this chapter uses an income analysis based on information generated during the period of field work, combined with primary statistical trade data obtained from local traders and *candelilleros*.

The conclusions of the survey showed that in August 2012, the average monthly income of a *candelillero* ranged between Mex$ 6,000-7,000 (US$ 360-420)[4.2] of which 60% to 70% is generated from the trading of candelilla and the rest by performing complementary farming activities, seasonal wild plant collection and cash transfers from development programs supported by different governmental institutions. It is important to consider that this is a flexible source of income that varies according to the time and resource invested. So some interviewed families reported higher incomes.

Compared to other activities such as the harvesting of Lechuguilla and other seasonal crops, the exploitation of candelilla is the most stable and profitable activity. It provides the rural families with a better rate of income/kg sold. According to CONEVAL, the minimal per capita income identified for rural communities to avoid income poverty has been estimated for August 2012 at Mex$ 1,489/month (US$ 89.34/month) and the cost of the basic nutritional basket for rural communities has been estimated at Mex$ 800/month (US$ 48/month) in the same period. Figure 4.7 shows a diagram comparing the family income from an average *candelillero* household versus the income and food poverty lines, respectively.

4.2 US$ equivalents calculated via World Bank data indicating a purchasing power parity (PPP) 0.06 for Mexico; see http://data.worldbank.org/indicator/PA.NUS.PPPC.RF.

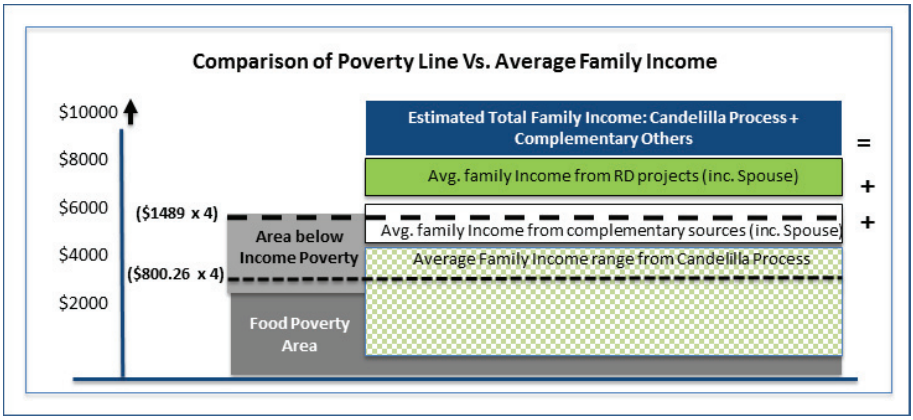

Figure 4.7. Comparison between poverty line and average family income of a *Candelillero*.

Note: Estimated values per month, per family. Amounts in Mexican pesos.
Source: Authors' calculations based on primary data obtained from surveys with *candelilleros* and secondary statistical information from CONEVAL, August 2012.

4.4.3 Availability of the candelilla plant

There are no official data about the total stock of candelilla in the region; however Mexican governmental organisms such as CONABIO and CONAFOR are currently working on the design of a methodology to carry out an official inventory. Some estimations based on technical information (Barriga Ruiz, 2003; CONABIO, 2009) indicate that the total area covered with candelilla corresponds to 630 500 ha, with a potential yield of wax of 15000 tons (equals to 24 Kg wax per ha).

4.4.3.1 Natural regeneration of the plant

When the candelilla plant is pulled out during the harvesting process, parts of the roots remain in the soil and these are sufficient to regenerate the plant. After a minimum period of three years the plant reaches a size sufficient to be harvested for economic purposes (CONABIO, 2009). With the exception of some communities from the state of Coahuila, the production of candelilla wax has been decreasing considerably in most regions around the Chihuahuan Desert. Therefore in order to estimate the reserve it is considered the following function, which is based on a three year period of natural regeneration:

$$Py = \Phi(t-1) - Y\,[(yt-1+yt-2+yt-3) - (yt-4+yt-5+yt-6)]$$

Where Φ(t-1) represents the estimated potential plant stock in the territory, minus the collected plant function Y which is calculated by the gap of collected plant in a three year period (yt-1+yt-2+yt-3) minus the amount of collected plant from the previous three years (yt-4+yt-5+yt-6). The latter is just a rough estimation of the possible available volume of candelilla in the region due to natural regeneration. However, in order to obtain a more accurate estimation, a more detailed analysis should be performed incorporating critical variables such as rain fall and other relevant climatic conditions. Based on this formula figure 4.8 indicates that there is positive trend in the available volume of plant material due to the reduction of the harvested levels in certain regions.

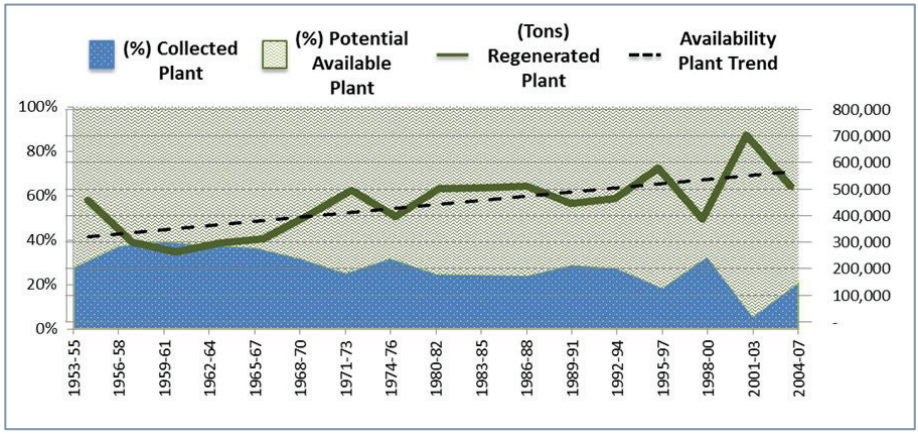

Figure 4.8. Natural regeneration of Candelilla wax.

Source: Authors' calculation based on statistical and technical information

4.4.3.2 Preservation and reforestation campaigns

CONAFOR has established reforestation campaigns that currently cover more than 34,000ha. It also provides support to establish commercial plantations in order to enhance the economic activity in rural areas. Since 2002, more than 27,000ha have been replanted, of which more than 13,000ha are in Coahuila state (CONABIO, 2009). Besides the issuing of utilization permits, another measure taken has been the establishment of protected natural areas where harvesting is prohibited. In the Chihuahuan Desert there is more than 1,800,000ha of controlled land. However, in these campaigns there is still some room for improvement, especially to define their efficiency and outcome. For that, the Mexican Government is encouraging research projects like the one by Céspedes-Flores

and Moreno-Sánchez (2010), as well as different technical regulations and training courses for rural producers (CONAFOR, 2010).

4.4.3.3 International regulations for candelilla

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between Governments whose main aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival (cites.org). Due to its generic inclusion with the rest of the species from the genus *Euphorbia* (nearly 2000 species) in the CITES, Appendix II in 1975, harvesting of candelilla is controlled. This does not necessarily mean that the species is threatened with extinction, but the CITES is a measure to prevent this. In a recent trade survey developed by the CITES secretariat (Schneider, 2009) it was concluded that the present level of harvest is unlikely to become a threat to candelilla (*Euphorbia antisyphilitica*) at the species level. Therefore, the final products containing candelilla wax (i.e. lipsticks, creams, bubble gum, and others) have been excluded from CITES regulations and only the wax is under the regulations of appendix II to track its performance throughout export permits or re-export certificates that control all international shipments of candelilla wax; this is regulated by CONABIO, which is the representative of CITES in Mexico.

4.4.3.4 Overall evaluation of the availability

According to the technical estimations by CONAFOR, based on the decreasing volume of utilization, the regeneration process of the biomass both by natural processes and due to preservation and reforestation campaigns, it is believed that the current level of exploitation does not endanger the plant at species level (Schneider, 2009; CITES, 2011). Moreover, international regulations ensure that there is control on the traded volume.

4.5. Discussion

As reported above, there is an established and operative value chain for candelilla wax. There is some room for improvement, however, for instance through the modernization and professionalization of the production process to add more value in the early stages. And Government and private firms are making efforts to enhance the functioning of the chain.

The production of candelilla wax offers the *candelilleros* a steady source of self-employment that can be combined with additional activities according to their interests and needs. Considering an average family is composed of four members (INEGI, 2010), and the complementary family members' income (contribution from the spouse), the earnings generated by families involved in this activity are clearly above the income and food poverty lines.

An important aspect to consider here due to its implications on long term continuity of the activity is the low share of young people living in the rural communities. As observed in the national statistics, people between 15 and 39 years old are leading the migration trend in Mexico in 2010 (INEGI, 2010). It is important to break that cycle by providing sufficient resources to encourage the permanency of young people in the rural communities; offering favourable living conditions would lead to the rational utilization of the natural capital.

The uptake of candelilla wax production, if done sustainably, might therefore be beneficial for other communities from the region. This could be particularly useful in communities that currently do not produce candelilla wax who are facing poverty conditions due to a lack of a secure income. This might also contribute to an increase in the wax volume supplied and thereby sharpen the competitiveness by economies of scale, allowing the product to improve its market share and accessibility to other industries. In section 4.4.2 the limited production volume of candelilla wax, caused by the reduction of rural labor was identified as a problem. Different socioeconomic trends and events have affected this, provoking the abandonment of candelilla harvesting by certain communities and the concentration of production clusters, with all the overexploitation constraints that that generates (CONABIO, 2009).

When considering the sustainability of candelilla wax production, it is important to note the efforts of several key actors. At the beginning of the 1990s, the Mexican Government started to experiment with different methods of replanting candelilla plants in the range area and evaluated each method's success (Tovar Villa, 1992; De la Garca de la Peña, 1993). To date, public and private institutions have developed different cultivation, regeneration and replanting strategies as explained by Schneider (2009) and CONABIO (2009). An important aspect which contributes to species preservation is the ecological adaptation of the candelilla plant which, due to its ability to reproduce vegetatively from

its roots, can regenerate within a few years of harvest activities (Bacon, 2009). The export of candelilla wax is regulated by a system of export permits, due to its inclusion in CITES.

4.5.1 Public and private efforts for rural development

In the previous sections, different needs of the rural population from the Chihuahuan Desert were identified, such as medical assistance, basic services delivery, education, job creation and modernization of technology in rural activities (principally oriented to the harvest and commercialization of NTFP).

This section addresses some of the current projects fostered by public and private institutions to promote the sustainable development of the rural areas in the Chihuahuan Desert. The majority of the projects are promoted by public development agencies, because most private firms are still primarily geared towards providing job sources and show limited participation in development efforts.

4.5.1.1 Social productive projects

In addition to its programs for the preservation and development of sustainable commerce for natural resources, CONAFOR provides programs to create *cadenas productivas* [productive chains] through the strengthening of social organizations and institutional capabilities as well as by providing training in the appropriate use of forestry resources. Two main examples of productive chains which aim to improve the candelilla wax process and to add value to the final product are present in Coahuila state in the regions of Cuatrocienegas and Ocampo (CONAFOR, 2012). Nevertheless these projects for the moment continue selling wax under the form of Cerote. Based on recent interviews with members of the mentioned productive chains, at the time of this research, they have only acquired production equipment without producing any value added product yet.

Of the few rural development efforts from private firms, there is the Candelilla Institute, which is a Mexican organization working towards the sustainability of candelilla wax production, supported by its technological associates and governmental agencies which are committed to the economic and social development of the rural communities dedicated to the production of candelilla wax (Schneider, 2009). The Candelilla Institute is sponsored by the Mexican company Multiceras, which is one of the most important exporters of candelilla wax (Ochoa-Reyes *et al*., 2010; FIRA, 2012) and is currently

developing different projects through its social responsibility program that support the communities of candelilla collectors by: encouraging personal development and training campaigns; improving safety conditions in working areas; promoting the settlement of local families in the rural areas; and collaborating with sustainable development programs (Ochoa-Reyes *et al*., 2010; FIRA, 2012; Multiceras, 2012). Another recognized private firm collaborating in preservation projects is Ceras Coahuiltecas, in the state of Coahuila. (Noriega, 2010)

4.5.1.2 Integrated projects for sustainability and rural development

The existence of the various projects established by governmental institutions and development agencies notwithstanding, due to the complexity of the problem and the lack of budgetary capacity there remain unsolved questions affecting the rural population. As addressed in the previous sections, social security and income poverty still affect the rural population. While efforts from governmental development agencies seem to be more focused on organizing the society, training people with different skills, and providing technology, the limited interaction with the private sector has created a gap between the market expectations and the current outcomes (Bromley, 1989). Because the current state-centered development projects consider private investors as outsiders, they leave them out of the decision-making process; but rural producers cannot reach specialty global markets by themselves, due to the lack of skills necessary to meet their demands (technical and logistics).

The concept of networks for rural development (Murdoch, 2000) holds the promise of a more complex appreciation of "development" than is traditionally observed in state-centered versus market-led strategies. The cooperation of private firms could provide the link to the global markets by going beyond their current role of mere buyer and providing the necessary conditions to build a sustainable working scheme. A core-satellite work model addressed by Freeman and Karen (1982) and Goldsmith (1985) would encourage private firms to develop agreements with small producers (in this case with *candelilleros*) guaranteeing a market with a fair price, providing credit, technology, inputs, technical assistance and encouraging the application of official preservation recommendations.

In Mexico, a government-led institution called FIRA encourages collaborative projects by providing different services related to training, credit, technical assistance and

technology transfer to promote the improvement of agribusiness in the region. FIRA is financially supported by the Bank of Mexico and with the collaboration of private firms acting as partners, fosters the production of small and medium rural producers, and has ongoing projects that support the production and commercialization of candelilla wax (FIRA, 2012).

Promoting and enforcing the rational use of natural resources should be considered when promoting the integration of all parties involved in the process, i.e., Government development agencies, private firms, *candelilleros* and research institutions. The interaction of all stakeholders will be crucial for the success of the preservation and reforestation processes. The strengthened networks would guarantee the candelilla wax value chain's positive performance.

Although the foreseen scenarios are positive, given the different interests of each actor, a common agreement should be encouraged as a trade-off, where shared interests intersect in order to stimulate collaboration in development projects into becoming an innovative partnership with a solid commitment on sustainable business models.

4.6. Conclusion

Candelilla harvesting is a source of self-employment for more than 3,000 rural inhabitants in the Chihuahuan Desert. It provides a flexible income that increases according to their own time and capabilities, with the possibility to combine it with complementary activities. Moreover, compared to other jobs in the region it provides a higher income. Given the current national and international regulations regarding the harvesting and trade of the product it is also clear that there are sufficient resources to encourage the growth of this activity in a sustainable manner when preservation and reforestation programs are followed. Sufficient market demand indicates a likely gradual increase of production volume.

Therefore, it can be concluded that the sustainable production of candelilla wax could serve as an important tool in poverty reduction and provide a development strategy for the rural communities from the Chihuahuan Desert that are currently not producing candelilla wax and are therefore missing out on this formal and permanent source of income. To promote a sustainable production of candelilla wax, the collaboration of all the relevant parties is necessary to ensure the proper utilization and preservation of the

plant. Such interaction can encourage sustainable production at new locations or to reactivate the activity in ancient candelilla wax producing communities. The participation of private firms in rural development projects can be a potentially important driver for this process. In the end, the promotion of the sustainable commercialization of candelilla wax offers two immediate benefits: it will contribute to rural development without overexploiting the resource and it will increase the production volume for current and new markets. This will have a positive effect on the competitive advantage with returns to scale.

Chapter 5: Empirical assessment of the benefits and challenges related to integrated rural development initiatives along the candelilla wax value chain

Abstract

Due to the limited literature that explores the possible interests and drivers that could encourage the participation of key actors in IRD, the present chapter explores empirically for a selected case study the identified motivational drivers and challenges of integrated rural development obtained in chapter 2. The empirical case consists in an ongoing initiative in northern Mexico between different actors (below described) to generate improvement and development opportunities for rural communities through the production of candelilla wax as the economic catalyser. The empirical study identifies the challenges faced by the different actors, their main motivational drivers, as well as the experiences gained during the designing and development process of the integrated project. In addition it is explored whether the benefits outweigh the challenges that must be addressed by the actors involved to succeed in integrated ventures generating sustainable business models.

This chapter is based on:

Arato, M., Speelman, S. and Van Huylenbroeck, G. (2013) "Integración de la inversión privada en el desarrollo de la cadena de valor de los productos forestales no-maderables Mexicanos. Oportunidad para el desarrollo rural sostenible de las comunidades del Desierto de Chihuahua." Paper presented at the international conference: Comercio agrícola y América Latina: Cuestiones, controversias y perspectivas, held in Sept.19 and 20 at Buenos Aires, Argentina.

5.1. Introduction

As described in chapter 2, most of the theoretical background related to IRD explores the expected changes in policies and interactions between the institutions involved. Literature concentrates on describing the organizational and cultural modifications that should be encouraged in order to ensure the success of development strategies. However there is limited exploration about the interests and drivers that could possibly encourage the participation of key actors, given the challenges that must be addressed when participating. The present research utilizes the theoretical exploration about the key concepts related with the integrated rural development philosophy described in chapter 2, in order to apply them in the selected empirical case of the rural communities from the Chihuahuan Desert described in chapter 4. The main objective of this chapter is to assess for the selected case study the challenges faced by the different actors, their main motivational drivers, as well as the experiences gained during the design and development process of the integrated project. This chapter also assesses the application of the initiatives described in chapter three by the actors involved in order to facilitate their integration.

The project consist in an ongoing initiative between different actors (below described) to generate improvement opportunities for rural communities through the production of candelilla wax as the economic catalyser. It considers the active participation of a private firm and a development agency working with rural producers organized in cooperatives. The project's scope is to motivate the active participation of the value chain's members to generate improvement of living conditions of the participant rural communities, collaborate on resource's preservation and strength up the supply chain (explained in detail in the results section). The selected case study is an ongoing project and the reported results have been gathered as the activities were developed. This case study has been found interesting for several reasons. Firstly due to the variety of actors from different institutions working together. Secondly because of the relevance of the economic activity for the evaluated rural communities. Thirdly because of the development opportunities offered by this economic activity, given the potential global markets that exist for the analysed product.

This research work explores the site-specific empirical case describing: 1) the different actors involved in the integrated project; 2) the value chain that serves as a mean to create

economic development, and finally 3) the different benefits and challenges observed by the relevant actors during the different stages of the project (from its design to its implementation).

5.2. Methodology

25 rural producers from the selected region were interviewed during the months of July and August 2012 and the same period of 2013. The total estimated number of rural producers in the region is 40. The group of interviewed producers included all the members from the two cooperatives where the IRD project was initiated as well as some non-members from the same region The cooperatives had 5 members each. This number was defined by the project based on availability, geographical location and interest from the rural producers. Purpose of the interviews with non-members was to get the perspective and concerns as externals to the evaluated projects. Besides rural producers also other actors were interviewed: 3 members from the private firm, 3 representatives from the rural development agency, and 3 members from the National Forestry commission CONAFOR.

A semi-structured questionnaire with an established interview plan was used to obtain primary data about the perspectives of each actor (rural producers, private firms, governments and research institutions) as described in Table 5.1 The primary data contains information from selected rural communities from the state Nuevo León in the communities of Icamole, El Milagro, Carricitos, El Delgado, Las Presas and San Antonio de Arista from the municipalities of García and Mina respectively (as shown in figure 4.1). During the data collection different aspects of the project were evaluated, using one to one sessions. The questionnaire was designed to identify the possible interest and drivers behind the participation from each actor; the activities performed during the different stages of the project; and the challenges faced during its implementation.

The memories and comments from the interviewed actors were also analysed using a qualitative method. The qualitative method consisted on grouping the answers according to the type of driver or challenge found during the project's implementation. The classification and grouping was based on the theoretical information from Ruttan (1984), Cohen (1989), Shortfall and Shucksmith (1998), Nemes (2005), as presented in chapter 2. The key drivers were grouped in the following concepts: 1) Solve / Tackle poverty; 2)

Generate economic development; 3) maximize resources; 4) Preservation of natural resources; 5) Decentralize aid; 6) Preserve cultural heritage; 7) Strengthen of supply chain; 8) Generate economic benefits; 9)Generate a positive social image; 10) Multi-level collaboration.

The main challenges were grouped in: 1)Ensure the proper information flow; 2) Proper follow up and measurement of project; 3) Proper risk management; 4) Proper resources management; 5) Correct operation; 6) Understand local culture and interests; 7) Committed participation, 8) Flexibility to adapt the internal policies and regulations. More detail about the classification and analysis of the obtained results is provided in section 5.3.

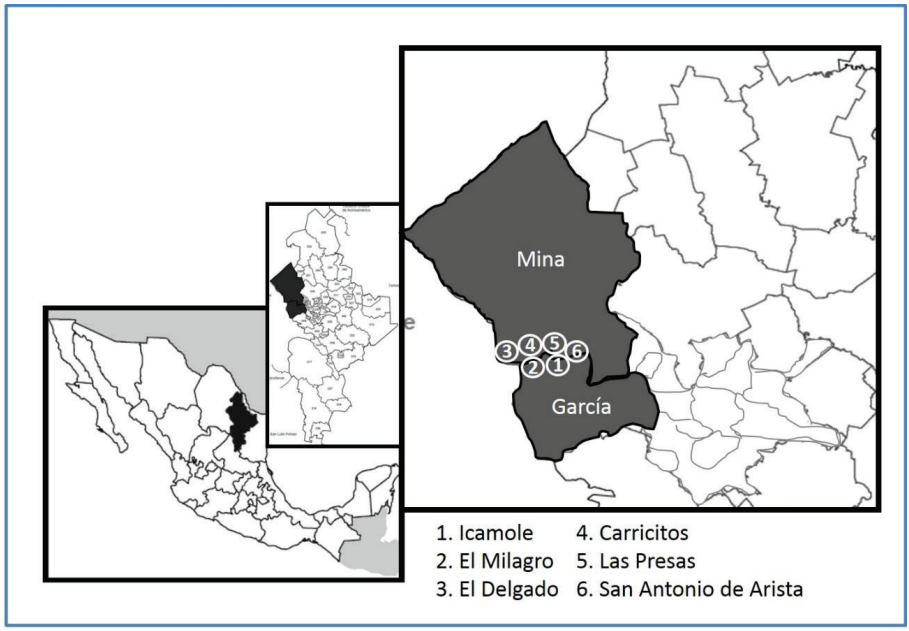

Figure 5.1. Location of analyzed rural communities from Nuevo León Mexico.

Source: Developed by authors based on collected data during field work. **Note.** Indicated location of communities for reference only, not geographically representative.

5.3. Results

5.3.1 Description of case-study: candelilla wax producers

This paper analyses the case of an integrated rural development project established by members of different institutions to activate economic development in selected rural communities in Mexico. Located in the northern – north-eastern part of Mexico, in the state of Nuevo Leon, the selected communities are quite isolated locations, characterized by an arid and semi-arid ecosystem with low levels of rain and extreme weather conditions that limits the agricultural activity and where the utilization of Non Timber Forest Products is the main source of income for most families from the region (Arato et al., 2014).

In most cases several Non-Timber Forest Products are collected and processed according to their seasonal availability. The present study concentrates on the analysis of one specific case: Candelilla (*Euphorbia antisyphilitica*). This is the plant from which candelilla wax is extracted, a wax used in many industrial applications (Candelilla Institute, 2013). For most of the families from this region the extraction and processing of candelilla represents their main source of income. The production of candelilla wax is an ancient activity, originally used by the natives of the region for different applications; and used for industrial purposes since more than 100 years ago (CONABIO, 2009; Schneider, 2009). Due to several causes the production activity decreased in popularity and volume or even disappeared in many areas. However in some areas like in the state of Nuevo Leon one is now rediscovering the activity, mainly thanks to the promotion from private firms and governmental institutions that are encouraging rural development strategies through sustainable economic activities using natural resources, based in productive chains as explained further (Arato et al., 2014).

To properly analyse the case study, table 5.1 describes the relevant actors from the candelilla wax supply chain that actively participate in the integrated development project to understand their role and contributions. The evaluated actors where identified according to primary data gathered during the field work period and secondary data from related literature (CONABIO, 2009, Schneider, 2009).

Table 5.1. Actors from the candelilla wax integrated development project

Actor	Description
Candelilla Wax Rural Producers (*Candelilleros)*	The producers of Candelilla wax are commonly known as "*candelilleros*". The interviewed *candelilleros* are from the rural communities: Icamole, El Milagro, El Delgado, San Antonio de Arista and Las Presas in the state of Nuevo León in Mexico. The production activity in these communities declined in 1990s. However since mid-2000's, the candelilla production has been re-activated and has reported an increasing production volume. The number of candelilla producers has increased in the last years (around 40 producers were identified during the interviews), increasing the relevance of the activity for their daily-basis income. During the field work period a total of 25 *candelilleros* from the mentioned communities were interviewed.
Rural Development Agency (RDA)	The evaluated Funding Institution is a second-tier development bank that offers credit and guarantees, training, technical assistance and technology-transfer support to the agricultural, livestock, fishing, forestry and agribusiness sectors in Mexico. As part of its financial products and services to promote growth and development, it has regional representatives which encourage special programs to integrate private investment in rural development initiatives through sustainable agribusiness.
Private Firm (PF)	The analysed firm is Mexican corporation specialized in design, fabrication and commercialization of natural, synthetic and petroleum waxes, as well as of related products for industrial applications. As part of its product portfolio the company offers value added formulations based on candelilla wax for different industries. In a way to strengthen its supply chain and as part of its social responsibility program, the company has identified the candelilla wax processing communities as one of its key stakeholders. It has established projects to support the communities of *candelilleros*, encouraging personal development and training campaigns; improve safety conditions in working areas; promoting the settlement of local families in the rural areas and collaborate with sustainable development programs.
National Forestry Commission (CONAFOR)	CONAFOR is the national forestry government commission responsible to promote and encourage preservation and development of sustainable commerce for natural resources, also provides socio-economic organization programs to create productive chains "Cadenas Productivas" through the strengthening of the social organizations and institutional capabilities. CONAFOR also provides technology transference and training about adequate use of forestry resources. For this activities, it relies in different local civil and research institutions such as: Universidad Autónoma de Nuevo León, Universidad Autónoma de Coahuila, Universidad Autónoma Agraria Antonio Narro, Universidad de San Luis Potosí, among others. http://www.conafor.gob.mx/portal/index.php

Source: Analysis developed by authors based on primary data gathered during the field work period and secondary data from related literature CONABIO (2009); CONAFOR (2008); Schneider (2009); Arato, et al. (2014).

5.3.2 Project's description

The project consist in an integrated initiative between the actors described in table 5.2 to generate improvement and development opportunities for rural communities through the production of candelilla wax as the economic catalyser. The project was launched as a pilot to evaluate its applicability for other communities within the Chihuahuan desert region. It considers the active participation of *candelilleros* through cooperatives in order to facilitate social organization and generation of common benefits. The project was created through an initiative from the mentioned Rural Development Agency together with a private firm to develop a scheme to boost agro-businesses based on sustainable production candelilla wax. It includes an initial fund specially created for this project combining resources from both promoting parties (described in detail in the sections below).

The project is based on the financing of agribusiness operations through an integrated value chain formed by the private firm and the producing cooperatives. The main objectives include the improvement of production process with technology and skills; proper resource preservation and socio-economic improvements generated by the proceeds of the business. In this case, the funds created by the RDA and the company are distributed under specific conditions and legal agreements to the rural producers through a specific mechanism of control and measurement. The company acts as a solidarity funding-partner which supports the cooperative with technology, training about technical skills, innovation and support with managerial activities. The funds are primarily oriented on support the purchasing operations, to provide innovative production equipment and materials to improve yield and product quality, as well as to cover specific costs related to resource management, reporting of results, legal procedures and other relevant needs.

One of the main characteristics of this project is that its financing is performed through a line of credit with preferential rate and not a cash transfer contribution. In the present scheme, the private enterprise contributes supporting rural producers with proper management of resources, due to their limited knowledge about financial instruments and resource management. The company contributes with its experience managing economic resources, generating reports and appropriate documentation to verify its efficient use and to encourage the necessary actions to secure positive returns. The expected outcomes from the project, additionally to the agri-business development and the provision of

sustainable economic activities for poor rural families, is that with the surplus income generated through the improved process the rural producers could develop common investment initiatives to contribute to their self-development. The common investment initiatives include the construction of clinics, schools and infrastructure necessary to fulfil their current gaps on basic services, according to their present needs (as described below).

5.3.3 Project's implementation

To analyse the project's implementation, it was segmented in five main phases based on the primary information gathered from the different interviewees. Each phase describes the activities performed by the actors involved as well as the learnings obtained during the process. Additionally, included in a dotted line in figure 5.1, there is a sixth phase which represents the possible application of the project's model in other regions, with its necessary customization according to the site-specific characteristics as explained further.

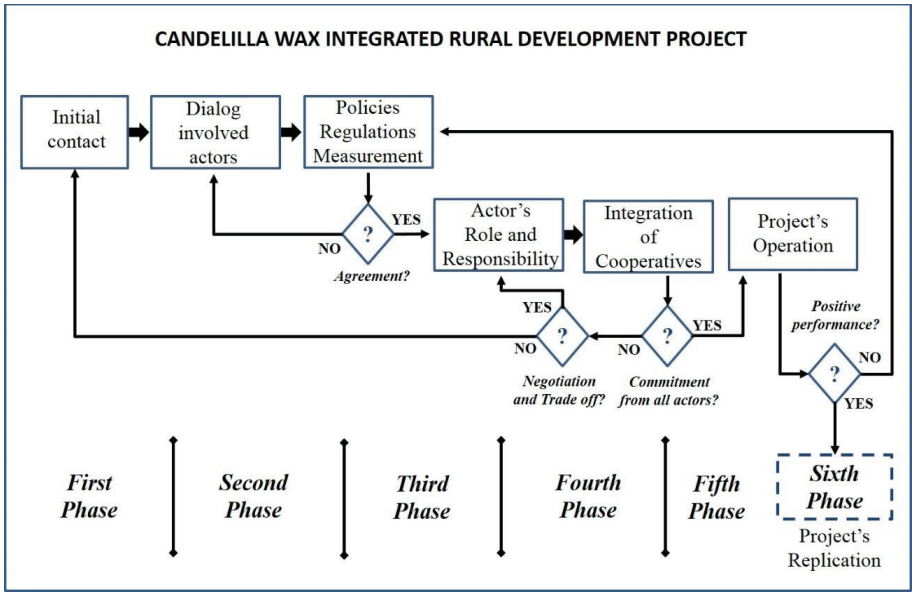

Figure 5.2. Phases of the candelilla wax' integrated rural development project.

Source: Developed by authors based on primary data gathered through interviews with the involved actors during field work.

The ***first phase*** was composed principally by the initial contact and dialog between rural producers *candelilleros*, personnel from Private Firm (PF) and local representatives from Rural Development Agency (RDA). In line with the learnings from chapter 3, the initial

dialog with *candelilleros* set basis to understand specific socio-economic conditions present at the rural communities and to determine the most suitable locations to run the pilot project.

Second phase consisted of establishing a dialog between the involved actors to define common interests and preliminary agreements on the economic activity to be performed, the relationships and negotiation schemes, as well as the roles and responsibilities from each participant. This phase also included the establishment of rural cooperatives to promote self-development through common investment. The intended strategies were oriented towards creating the necessary infrastructure to contribute to the improvement of their current living conditions.

In this case, the conjuncture of the three parties was encouraged by the PF, which on one hand, had close contact with *candelilleros* due to their commercial relationship (more than 10 years) as part of the candelilla value chain and on the other hand, had good relationship with RDA due to previous experience with working together in different financing projects.

The ***third phase*** included the design and development of control measures to keep track of the project; following steps included: establish information flow systems; define regulations and policies for the participants; as well as to define the credit lines and initial amount of economic resources. As shown in figure 5.1, this phase included a milestone to evaluate the achievement of a common agreement on the proposed policies, measurements, and regulations. This phase was executed principally by the local representatives from RDA and PF which identified the limitations, operative costs and expected sales budgets according to market forecasts and production capacities. Based on the comments from the interviewed actors, this phase demanded more than 40 hours of meetings between members from the RDA and PF.

The ***Fourth phase*** consisted of defining the roles, responsibilities, obligations and rights of each actor. This phase also included the selection of *candelilleros* to establish the cooperatives. This activity was one of the most complicated tasks according to the comments from the representatives from the PF and RDA respectively, principally because not all the *candelilleros* were candidates or interested to be part of the two cooperatives.

The cooperatives were composed by five members each, based on geographical limitations, internal relationship between the producers and availability. The composition of the cooperatives was defined and agreed by members from PF, RDA and *candelilleros*. Based on the comments from the interviewed representatives, it was necessary to establish several rounds of dialog before defining the composition of the cooperatives (represented in figure 5.1 with two milestones). At the beginning, most *candelilleros* were reluctant to be part of the cooperatives, principally for the involved responsibility to commit in production volumes and in participation in different extra activities related to training or investment in common infrastructure. When asked about the reason for their reluctance, the interviewed *candelilleros* referred to previous campaigns and projects developed by other institutions and previous local governments that presented negative outcomes. At this point they were sceptic about getting involved in such activities again. Others were reluctant to work with specific members of the community, basically due to personal affairs and dysfunctional relations between some of them.

PF's representatives were deeply involved in social organization activities, basically due to their commercial relationship with *candelilleros* from the region. The PF invested time and resources to explain the benefits (both in the mid and long-term) that could be generated through this type of projects. The positive image and references that *candelilleros* had about the company based on its fair commercial trade policies, facilitated the process to attract *candelilleros*, as referred by the interviewed rural producers.

Since this project required the participation of *candelilleros* in training sessions and other additional skills transference courses, a certain level of technical skills in the process where required from the *candelilleros* in order to be considered as possible members of the cooperative. This excluded some of the community members. Some others were simply not suitable to be part of the cooperatives due to administrative complications with missing legal documents and identity papers.

Once the *candelilleros* were selected to be part of each cooperative, the next step was to establish the cooperative. The Fourth phase includes the establishment of the internal revision process, structural lay out, management-leadership system and legal registration of cooperatives. As referred by the interviewed, at this point where the cooperatives were already assembled it was important to build the team work and explain the rules and

internal policies that must be met during the working process. In line with the initiatives described in chapter 3, during this phase, the *candelilleros* and the representatives from the PF received extensive training about organizational skills, administrative courses and other specialty workshops from the RDA's representatives and the contracted civil institutions. Seminars about environmental regulations, preservation of natural resources and utilization permits were provided to the teams with the support of representatives of CONAFOR and other environmental institutions.

The most demanding and time consuming task was performed during this phase, as commented by the interviewed representatives from the PF. The activity that took most time and resources was to support the *candelilleros* with their legal documents and administrative paper work. The limited education level from *candelilleros* (average below fifth level of elementary school) complicated their ability to read and understand legal concepts. Part of the tasks performed by the representatives from the private firm and the rural development agency was to organize workshops to explain the registration procedures and how to fill the necessary forms, as well as to support them with transportation to governmental offices located at the state's capital city to apply for renovation of legal documents, identity papers and other various administrative works. The interviewed agreed on the importance of this activity for the execution of the project, even when these activities are not that significant or relevant for the project's scope, they actually define the timing and successful execution of the project itself. The proper execution of this task ensures that all the members clearly understand the responsibilities and rights granted by working in the cooperatives. Furthermore the necessary legal procedures are properly fulfilled in order to ensure the project's continuity in the future by meeting environmental, fiscal and social regulations.

The ***Fifth phase*** represents the actual stage of the project at the time of this research. This phase included the start-up; ongoing operation of the process; and generation of common benefits for the actors involved. This phase shares the same level of importance as the previous phases, but it is in this phase, that results are more tangible because the work in process can easily be observed and measured by internals and externals through profit generation.

This phase included a milestone to evaluate the project's operation performance. However, since this is an ongoing project, the evaluation has not been completed yet. As

shown in figure 5.1, a negative performance would lead into a revision of the process in order to identify improvement opportunities. On the other hand, a positive evaluation would conduct to a sixth phase that would comprise a possible replication of the project in other regions.

5.3.4 Identified challenges and motivations from the actors involved

The interview process provided relevant information about the main motivations that served as a driver to encourage the active participation of the actors involved. Table 5.2 includes a matrix in which their motivating factors are confronted against the reported challenges.

Based on the obtained results, and the analysed literature from chapter 2 (Ruttan; 1984; Cohen, 1989; Shortfall and Shucksmith, 1998; Nemes, 2005), the key motivating factors identified by the different actors were grouped in the following concepts: 1)Interest to solve or tackle poverty conditions present in rural communities; 2)generate economic development for rural inhabitants; 3) maximize the resources (human, technological and capital) provided by both central governments and private firms; 4)foster wellbeing and ensure the sustainability of the communities by preserving the natural resources; 5) decentralize the aid and development support, principally between central and local governmental institutions; 6)preserve cultural heritage and enable permanence of local inhabitants to combat uncontrolled out-migration; generate sufficient wealth for the actors involved; 7)strengthening of the supply chain, ensuring its proper functioning and continuity; 8)generate economic benefits for the actors involved; 9)generate a positive image from the actors involved and key stakeholders; 10)and encourage collaboration between institutions from different levels, responsibilities and scopes.

The main challenges faced by the interviewed actors during the project's implementation were grouped in the following concepts: 1)ensure the proper flow of information throughout the different actors and channels; 2)guarantee the correct follow up and measurement of the project in order to ensure the efficient application of resources and, if necessary, establish the respective corrective actions; 3)ensure the proper management of the risk involved in the project, in order to minimize it at its potential effects; 4) ensure the proper utilization and management of resources; 5)guarantee the correct operation according to national regulations and the agreed commitments; 6)understand the

interests, cultural background, socio-economic configuration and the networks that frame the local society; 7)participate committedly to meet the agreements, collaborating to foster common benefits; 8)and to ensure the sufficient flexibility to adapt the internal policies and regulations in order to facilitate the collaboration with the rest of the actors involved, according to site-specific situations.

During the interview process, each actor identified the different factors that motivate their active participation in the project. At the same time they also identified the challenges faced during the different project phases. The obtained information was included in the matrix presented in figure 5.2. As observed, each one of the actor was identified with a number (lower section of the figure), for instance, the Rural Development Agency was identified with a number 2 and the private firm with a number 3. The matrix presents a column named "motivation", this column include the above described 10 motivating factors. In the same table is also displayed the type of challenges that they identified for each motivating factor. For instance, the motivation of solve and tackle rural poverty presents challenges related to risk management and flexibility for central governments (number 1) and rural development agency (number 2). For the same motivation, private firms (3) and rural communities (5) reported challenges related to secure a committed participation in the project. Similar with NGOs (4) and rural development agencies (2) that were the only whom identified for the same motivating factor, challenges related to the proper understanding of local interests.

Table 5.2. Integrated Rural Development Matrix - Motivations and Challenges.

MOTIVATION	CHALLENGE							
	Proper flow of Information	**Follow up and Measurement**	**Risk Management**	**Resource Management**	**Proper Operation**	**Understand local interests**	**Committed Participation**	**Adaptation and Flexibility**
Solve / Tackle Rural Poverty	1 2 3 4 5	1 2 3 4 5	1 2	1 2 3 5	1 2 3 4 5	2 4	3 5	1 2
Economic Development	1 2 3 4 5	1 2 3 4 5	2 3	1 2 3 5	1 2 3 5	2 3 4 5	1 4 5	1 2 3
Maximize Resources	1 2 3 4 5	1 2 3 4 5	2 3	1 2 3 4 5	1 2 3 4 5	2 3 4 5	1 2 3 4 5	1 2 3 4 5

De-centralize Aid and Support	1 2 3 4 5	1 2 3 4 5	1 2	1 2	1 2	2 4	1 2	1 2
Foster Wellbeing and Sustainability	1 2 3 4 5	1 2 3 4 5	1 2 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	3 5	1 2 3 4
Cultural Heritage and Settlement	1 2 3 4 5	1 2 3 4 5	2	1 2 3 4 5	2 4	2 4	3 5	1 2
Value Chain development	1 2 3 4 5	1 2 3 4 5	2 3	2 3 5	2 3 5	3 5	1 4 5	1 2 3
Wealth Generation	1 2 3 4 5	1 2 3 4 5	1 3	2 3 5	2 3 5	2 3 5	3 4 5	1 2 4
Positive Social Perception/Image	1 2 3 4 5	1 2 3 4 5	1 2 3 4	2 3 4	2 3 4	2 3 4	3 4	1 2
Multi-level Network	1 2 3 4 5	1 2 3 4 5	2 3 4	3 4	2 3 4	3 4	1 2 3	1 2
1. Central Governments / 2. Rural Dev. Agency / 3.Private Firms / 4.Civil Institutions-ONGs / 5.Rural Communities								

Source: Developed by authors based on primary data gathered through interviews with the actors involved during field work period.

As displayed in table 5.2, most motivating factors are shared by more than one actor, as well as the challenges that must be addressed in order to successfully operate the integrated rural development projects. The results showed a relationship between the number of challenges and the relevance of the drivers. The more an actor is motivated by certain factor; the higher the possibility to face challenges related to it (figure 5.3). For instance the motivating concept of "Decentralized aid and support" was reported to be much more relevant for central government representatives as compared to rural producers. In this case, while central government representatives reported 7 and 8 challenges respectively, the rest of the actors reported only two possible challenges, related principally to general concepts like the proper follow up and information flow.

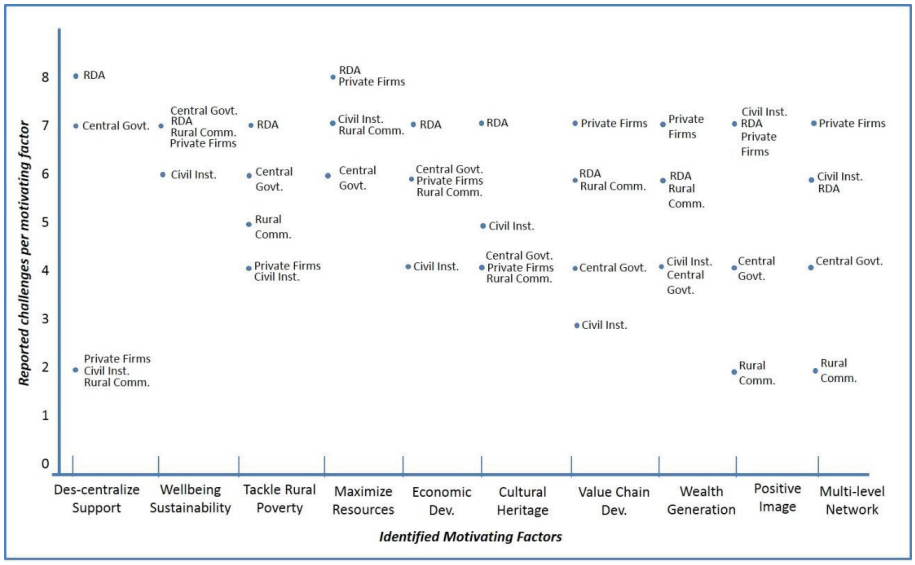

Figure 5.3. Reported challenges per motivating factor from each group of actors.

Source: Developed by authors based on primary data gathered through interviews with the involved actors during field work.

5.4. Discussion

The main objective of this chapter was to assess the challenges faced by the different actors, their main motivational drivers, as well as the experiences gained during the design and development process of the integrated project that served as a case study. The analysed empirical case showed that the most frequent drivers to participate in IRD for the interviewed actors, were related to generate economic development and wealth; to maximize the available resources (economic, human and technological); as well as to foster well-being and sustainability. The main difference between IRD and traditional business models lies in the fact that traditional business models are mainly focused on wealth generation, without paying sufficient attention to the well-being of rural producers and the sustainability of the economic activity. Firms conducting traditional business models generally depend on a multi-layered supply chain. Firms source their products from wholesale distributors after a long chain of traders that facilitate the sourcing process but create a gap in the relationship between the rural producer and the final consumer. According to the number of intermediaries in a supply chain, the cost of product increases proportionally for the final user, which at the same time generates a shrinking pressure on the selling price from rural producers (Jarosz, 2000; Tallontire, 2007; Tallontire, 2011;

Peterson, 2013). IRD aims to reduce the gap between final user and rural producers. The reduction in intermediaries could generate better conditions for rural producers and an improved quality of products due to the skills and training offered by the private firms (Da Silva and de Souza Filho, 2007).

However, as commented, there are a number of challenges that need to be solved by all the actors involved, when participating in IRD. As reported, in the empirical case the main challenges for the interviewed were related to ensure the appropriate project's follow-up and measurement; the correct flow of information; the proper management of resources to guarantee its efficient application; the proper operation of the institutions involved and its representatives; as well as the appropriate understanding of every ones' interests and expectations.

As learned from the experiment, the participants addressed different measures in order to minimize the challenges faced during the project's design and implementation. Based on the literature review, it is included below an analysis of the actions taken by the project members in relation to relevant theoretical recommendations.

In order to secure its proper development and performance, in line with the recommendations from Lowe et al. (1998), Murdoch (2000) and Giessen and Böcher (2009), the project's objectives, work plans and key process indicators were developed in multi-level forums, including representatives from each group. The project included the interaction of members from different institutions from a variety of responsibility levels, as suggested by Saraceno (1995), Murdoch (2000), and Ray (2000).

Other action taken by the actors to facilitate the project's success, was that they took in consideration locally available natural resources, using for this matter, official technical and legal instruments such as utilization permits which provides a certified evaluation from an approved forestry engineer, according to the regulations from the national environmental agency "SEMARNAT", as recommended by Shortfall and Shucksmith (1998) and Murdoch (2000).

In line with the recommended concepts from Cohen (1989), Nemes (2005) and Giessen and Böcher (2008, 2009), governmental representatives, both at central and local level presented a clear flexibility and adaptation capacity sufficient to adjust criteria according to regional site-specific characteristics. And last but not least, coinciding with the

concepts addressed by theoretical background from chapter 3, the opportunity to participate in the integrated development project extended along the value chain, reaching the final user through social responsibility campaigns in market niches (Carroll, 1991; Kell, 2003; Kell, 2005; O'Connor and Meister, 2008; Cruz, 2009; Ma, 2012; Archel et al., 2011).

As mentioned, the analysis included a theoretical Sixth phase which represented the possible replication of the project's model in other communities. This possible replica could be even developed in the current region by forming other cooperatives with *candelilleros* that were currently not involved. Another possible option is to establish the project's integrated model in other regions, which in this case might require a customization according to regional-specific economic, social, cultural and environmental aspects (van der Ploeg and Marsden, 2008; Marsden, 2010). The application of a sixth phase depends on the success of the project itself, which would act as reference for the rest of *candelilleros* within the same communities and those from other regions. Success would also provide confidence to the representatives from the governmental institutions and private firms to keep participating in this type of projects.

In relation to the improvement actions generated for the project members, the updated status as of June 2015 showed some similarities with the activities reported in chapter 3. Most of the improvement actions were related to technical improvement of production sites, including the implementation of newly-developed processing techniques to improve safety conditions at production sites and to increase the product's added value. The rural producers have been able to increase their production capacity and thereby also their direct income. Furthermore improvements in infrastructure were observed: for example the restoration of the local elementary school. Other actions like the establishment of a pension fund and the construction of clinics are still planned but have encountered some delay due to recent administrative changes in the Mexican tributary law related to the operation of cooperatives and the applicable regulations from the social security system.

5.5. Conclusions

The empirical research developed in the present chapter provided a deeper exploration of the theoretical concepts developed in chapter 2. Based on the evaluated concepts, the key element for the success of integrated rural development projects seems to be the proper

identification of the motivating factor(s), which in turn, would encourage each actor to get actively involved in such initiatives. The information reported in the present chapter was consistent with the theoretical concepts about the most common motivating factors and challenges that were encountered by each member, according to their own set of interests. Moreover, it provided case specific information about how the actors involved found solutions to their own challenges and succeed in the project' implementation process.

The observed benefits obtained in different cases from the applied literature, as well as in the evaluated case-study led to considerate that Integrated Rural Development strategies represent a functional opportunity for improvement, once the differences are managed at the point that a general trade-off and agreement is accomplished by the actors involved. However, as commented, there are a number of challenges that need to be solved by all the actors involved, when participating in IRD. As reported in the empirical case the main challenges for the interviewed were related to ensure the appropriate project's follow-up and management; as well as the appropriate understanding of every ones' interests and expectations.

For all the actors involved, the challenge in the future is to continue working committedly in order to continue the economic activities and generate the development strategies. In case of the private firm and the development agency, their main challenge in the future relies on find the proper means to replicate the project to create more cooperatives in the same and other communities. The project members should be able to recognize specific conditions from the targeted *candelilleros*, in order to identify the socio-economic conditions that could possibly facilitate or hinder the project's development and replication. In order to facilitate the analysis and understanding the targeted communities, chapter 6 proposes the assessment of a theoretical framework that could serve to identify such socio-economic conditions.

Chapter 6: Assessment of socio-economic configuration of value chains: a proposed analysis framework to facilitate integration of small rural producers with global agribusiness

Abstract

The working relationship between private firms and small and medium scale rural producers in integrated rural development projects represents additional complications and challenges beyond economic aspects. Often IRD projects aim at integrating local small scale producers in national or international value chains. Members of global value chains should consider non-traditional aspects associated with small-scale producers, such as social, cultural, environmental and political factors. In order to fully understand the role and potential of integrated value chains, there is a need to move beyond descriptions of product flows, to examine how supply chains are built, shaped and reproduced over time and space. This chapter evaluates the empirical application of a conceptual framework known as the Rural Web to analyse the socio-economic complexity of a specific agribusiness value chain. The empirical analysis tests the applicability of the proposed framework as a tool for value chain analysis complementary to traditional value chain analysis, going beyond linear descriptions of product flows. This Rural Web could offer decision-makers a platform to identify key actors not traditionally considered in value chain analysis, as well as the social interrelationships that occur at different dimensions. This information would enable the identification of corrective and preventive measures to enhance agribusiness value chains.

This chapter is based on:

Arato, M., Speelman, S., Dessein, J. and Van Huylenbroeck, G. (2015) Assessment of socio-economic configuration of value chains: a proposed analysis framework to facilitate integration of small rural producers with global agribusiness. Paper under review.

6.1. Introduction

Various authors have investigated the ways in which the relationship between small-scale producers in developing countries and agribusiness firms can act to enhance rural livelihoods (Blandon et al. 2009). At the same time, contemporary development policy prescriptions often place emphasis on the potential of closer integration of poor people or areas with global markets. In accordance with this perspective much of the literature has concentrated on exploring how firms and farms in developing countries can be integrated into global markets through value chains (Bolwig et al 2010, Metzger et al. 2010, Trienekens 2011). International experience has demonstrated that value chain analysis can be an important tool in efforts to enhance the performance of agricultural, food and fibre systems. In IRD it can help chain stakeholders and policy-makers to identify corrective measures and to kick-start the development of areas and activities where the potential for growth has been identified. Many methods for value chain analysis have evolved in recent years, ranging from the more descriptive and qualitative to modelling and simulation studies (Da Silva and De Souza Filho 2007).

However, for a private firm working with small scale producers and principally with those from developing countries, generally with a series of socio-economic disadvantages, there are usually additional complications and challenges that go beyond the economic approach. Members of global value chains (sourcing channels, producers, distributors and final consumers), additionally to cost-reduction and improvement strategies, should consider non-traditional aspects from the small-scale producers such as the social, cultural, environmental and political. As Marsden et al. (2010) noted, in order to fully understand the role and potential of chains, there is a need to move beyond descriptions of product flows, to examine how supply chains are built, shaped and reproduced over time and space. Authors like Tallontire et al. (2011) and Tallontire (2007) recognize the importance of analysing the 'horizontal' along with the 'vertical' dimensions of governance in a value chain analysis. One potentially interesting approach is to examine regional food or natural resource chains from within, to focus upon the social relationships of trust and cooperation between the actors within the network with a view to identifying obstacles and opportunities (Jarosz 2000; Peterson 2013). Along the same line Block et al. (2008) propose a "value web" approach that considers the different dimensions in which a value chain develops and explores the interactive and iterative relationships between the actors involved.

This chapter aims to go further in evaluating the socio-economic complexity of a value chain exploring the potential application of a methodology known as 'Rural Web analysis' (Van der Ploeg and Marsden 2008) as a complementary approach to traditional-linear value chain analysis tools. The present research intends to assess the applicability of the Rural Web as a tool to analyse the interconnections between six different dimensions of the value chain (below described). Its results would provide analytical insights that would remain hidden when applying a linear (producer to consumer) analysis of a value chain. Moreover, greater understanding can be achieved in relation to the strategic linkages - both between the actors involved in generating a product's value and also with other actors who have an indirect effect on the agribusiness value chain, as shown in figure 6.1.

In order to demonstrate the appropriateness of the tool for the above described purpose, this dissertation includes an empirical application of the Rural Web to the selected candelilla wax case. This exercise will show the potential of the tool and it will also generate several interesting outcomes for the candelilla case: It will increase common understanding of the rural reality (as perceived by the different actors involved); it can serve as a starting point to negotiate and resolve the identified differences in opinions, needs and expectations; it can identify possible pathways to foster efficient improvement strategies; as well as enabling the proper identification and management of possible risks to ensure the sustainability of the value chain.

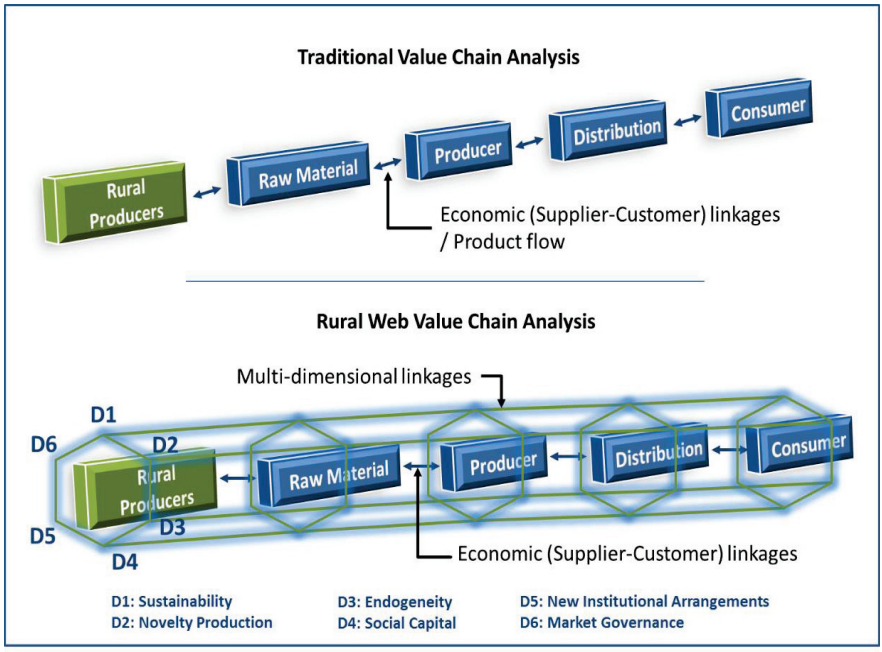

Figure 6.1. Conceptualization of Rural Web applied on value chain analysis

6.2. The Rural Web

The Rural Web, as described by Van der Ploeg et al. (2008), is an analytical framework that allows for a thorough exploration of the empirical characteristics of specific localities, wider regional settings and development initiatives. It consolidates the large body of theoretical and empirical work on rural matters. In accordance with Horlings and Marsden (2012) a "Web" could be defined as the relational system through which the human and the ecological components of a territory interact and intersect. Six dimensions, each of which highlights particular features of the web, can be distinguished (Van der Ploeg et al. 2008, Marsden 2010) : "sustainability", "novelty production", "endogeneity", "social capital", "new institutional arrangements" and the "governance of markets".

A series of potential applications of the Rural Web has already been identified (Messely et al. 2013): as a tool for comparative analysis of different development paths, within and between regions; as an approach to sustainable rural development; and as a diagnostic tool for exploring the potential limits of rural development patterns. This research, however, is the first attempt to use it to analyse a supply chain. On the one hand, this

application is based on the recognized importance of the value chain as the locus of economic growth and development for small and medium sized rural producers and their communities (Arnold and Ruiz Pérez 1996, Fisher and Dechaineaux 1998, Belcher et al. 2005, Marshall et al. Eds. 2006, Belcher and Schreckenberg 2007, Syampungani 2009). On the other hand, it reflects the premise of Van der Ploeg et al. (2008) who stated that the performance of a regional economy, its comparative advantages, its competitiveness, innovativeness and sustainability could be explained by a functioning and comprehensive web.

6.3. Empirical Case Study

The case study area is composed of rural communities from the Chihuahuan Desert, a region which extends over 450 000 km² and includes part of the northern Mexican states of Chihuahua, Coahuila, Durango, Nuevo León, San Luis Potosí and Zacatecas (Candelilla Institute 2013). The region is characterized by an arid and semi-arid ecosystem, with low levels of rain and extreme weather conditions which limit the potential for agricultural activity. As a consequence, the collection of Non Timber Forest Products is the main source of income for most families. One of these products is candelilla. For about 3000 families from this region the extraction and processing of this plant represents the main source of income.

The commercialization of candelilla is regulated by the Mexican secretary of environment and natural resources "SEMARNAT" through its Mexican Official Norm: NOM-018-SEMARNAT-1999. The plant is collected from its wild environment and processed to extract a wax product known as "*cerote*", which is transformed into candelilla wax through a refining process. The activity is mainly undertaken by men with sporadic support from the women. Most *candelilleros*, as they are called, collect the plant from communitarian land properties. These are extensions of common land provided to a group of tenants, based on the Political Constitution of the Mexican United States (Art. 27) and the internal regulations of the communitarian assembly. The tenants are entitled to undertake agricultural activities and utilize the natural resources (including candelilla and other wild species available), as stated within the utilization permits issued by the Mexican authorities who regulate the rational use and preservation of the resources (CONAFOR 2008).

The production of candelilla wax is a very old practice, and there are records of production volumes for industrial purposes back in the 1950s. For a number of reasons, the practice declined in popularity, and was even abandoned altogether in many places. For some years, production only took place in the Coahuila State and at much lower volumes. Recently, the states of Nuevo Leon, Zacatecas, Durango, Chihuahua and San Luis Potosí have revived the activity, mainly due to promotion by private firms and government institutions, which are encouraging rural development by developing natural resource based productive chains (CONAFOR 2008, Arato et al 2014). The value chain starts with the *candelilleros*, who process the plant and trade it with local firms that then refine the product to produce the candelilla Wax. Due to its characteristics, candelilla wax is a highly valued product for specialty applications in different industries, such as cosmetics, pharmaceuticals, the food industry, graphic arts and printing, among others. The main consumers of candelilla wax are international markets in the USA, Europe and Asia, where 90% of the production volume is traded. The domestic market in Mexico accounts for less than 10% of the total volume produced. Mexican refinery companies are also participants in the candelilla value chain, as they export the product to firms from the abovementioned markets (principally wholesale distributors and some large scale producers). Candelilla wax reaches final consumers in the form of a component for specialty consumer goods (Arato et al. 2014).

6.4. Methodology

Table 6.1 identifies the actors of the candelilla wax supply chain based on secondary data (CONABIO 2009, Schneider 2009). Using this information, a plan for the interview process was established in order to obtain primary data about the perspectives of each group of actors. Primary data was obtained during a period of fieldwork in selected rural communities from three states in the Chihuahuan Desert (Nuevo León, Coahuila and Zacatecas), during July and August 2012 and during the same period in 2013. The selection criterion for rural actors to be interviewed related to the importance of the production of candelilla wax for their community and their experience of producing it. The interview was applied to 42 participants (described in table 6.1). In order to select the rural producers, a general invitation was sent to all the *candelilleros* from the evaluated communities. Those who accepted were included in the interviews. The interviewed actors include 29 rural producers, 4 members from private firms, 2 members

from a local university, 6 members from Forestry Governmental Agencies and Forestry Engineers and 1 member from a local government office.

During the data collection the different aspects of the Rural Web were evaluated, using a semi-structured questionnaire. The interviews revolved around the six dimensions of the Rural Web. The respondents were presented with a number of statements relating to each dimension, and they were asked to give their perspective on each of these statements using a 4-point scale reflecting their level of agreement with the statement (Annex 6.1). Each statement was developed based on the theoretical definition of each dimension (below described) and previous knowledge from the region. The knowledge on the selected case study was obtained from local representatives and during working experience prior to the above mentioned fieldwork period. The local knowledge was relevant to formulate the statements according to the socio-economic conditions of the evaluated actors. It allowed to translate the theoretical definitions into applicable concepts. An overview of statements included in the questionnaire is given in the following paragraphs.

In accordance with the generally accepted definition of "*Sustainability*" as the existence of the social and ecological conditions necessary to support human life at a certain level of wellbeing for future generations (Earth Council 1994, van der Ploeg et al. 2008). The analysis include a series of statements that would provide the insights and perspectives from the different interviewed actors in relation to: i) the continuity of the activity; ii) the extent to which the income generated by the activity is sufficient; iii) their opinion about the current economic revenue from the activity; iv) their opinion about the involvement of future generations in the activity; v) their perception about future improvement in the activity; vi) whether they believe there is sufficient stock of the plant to continue processing; vii) their awareness and knowledge about recommendations for plant preservation; viii) their opinion about how involved the rural producers are in resource preservation measures; ix) their perception about the reforestation campaigns and their effectiveness. The respondents provided their perceptions on all of these aspects using a four point scale (i.e. for question viii, the respondent was asked to indicate the degree of involvement of rural producers in resource preservation measures; here the scale ranged from little involved to highly involved).

The second dimension "*Novelty Production*" refers to new insights, practices and artefacts developed to improve the process or the product. At the same time, it refers to deviation from the rule, distinguishing its results from the accumulated or expected knowledge (van der Ploeg et al. 2006, Marsden 2010). Therefore, it was evaluated under this dimension to what extent the changes or improvements are made by the *candelilleros*: i) in the plant collection process; ii) in terms of simplifying the wax production process; iii) to increase the production volume; and iv) for the preservation and reforestation of the plant. Other aspects included in the evaluation of this dimension were the level of diversification and multi-functionality currently taking place (Ellis 2000, Ellis and Biggs 2001, Durand and Van Huylenbroeck 2002, Nemes 2005). This includes asking about v) the development of other initiatives for complementary activities (tourism, cultural events, traditions, other activities). For all these aspects, the respondents were asked to rate the extent to which these actions took place.

In line with the premise stated by van der Ploeg et al. (2008) about endogenous development which occurs when there is sufficient consensus about the goals of development and, consequently, about what can be considered as local resources and the value of local entities as resources, the following aspects in the evaluation of the dimension "*Endogeneity*" were included: i) to what extent the *candelilleros* depend on other entities (private firms, buyers, government) to collect and process candelilla; ii) the level of dependency on others to obtain the processing equipment and supplies: iii) the dependency on others to learn the process and obtain training; iv) how the *candelilleros* organized the development of community improvements (building of schools, roads, hospitals, …); and v) how the *candelilleros* attempt to increase the added value of the wax.

The fourth dimension "*Social Capital*", as defined by Fukuyama (1999) is an instantiated set of informal values or norms shared by the members of a group. It generally refers to trust and willingness to live by the norms of one's own community and to punish those who do not (Bowles and Gintis 2002, Durlauf 2002). Therefore, within this dimension, the "collective efficacy" (Sampson et al. 1999) of the *candelilleros* was measured by analysing their ability to engage in networks, cooperate and make use of social relationships for common benefit. The statements include: i) how much cooperation exists between the *candelilleros* from the same community (sharing knowledge, resources,

support); ii) how organized are the *candelilleros* to achieve common benefits; and iii) how good is the relationship between *candelilleros* from different communities.

The ability to achieve synergistic "win-win" outcomes, as addressed by Barrett et al. (2005), depends largely on the "*New institutional arrangements*" that shape the incentives and constraints faced by human agents. In order to analyse this fifth dimension, the respondents were asked to evaluate the institutional constellations that solve coordination problems and support cooperation among *candelilleros* and different actors. The statements include cooperation with: i) Local government institutions, ii) Universities and research institutes; as well as iii) Private firms.

The final dimension considered is "*Market Governance*". The capacity to control and strengthen markets, as well as to construct new ones, is related to the way in which a certain supply chain is organized, the distribution of the value created, and how the potential benefits of collective action are delivered. Candelilleros act as self-employed producers, working within their own territory and having the opportunity to decide whether to produce candelilla wax or undertake any other complementary activity. To assess "*Market Governance*", the analysis differentiates between two different market governance capacities: 1) the capacity of *candelilleros* to control the market (sale price and offer), by evaluating: i) their influence on the selling price of candelilla wax (in its simplest form, known as "*cerote*"); ii) the feasibility for *candelilleros* to produce an additional quantity of candelilla wax per month (10Kg; 30Kg, 60Kg extra). 2) The capacity of the other actors along the value chain to control the market (demand) by questioning: iii) the influence of private firms on the purchase price of candelilla Wax (*cerote*); iv) the influence of final users on the purchase price of candelilla wax (*cerote*); and to analyse the demand volume of candelilla wax in the market, by v) the feasibility for a Private firm to purchase an extra quantity of 10, 30 and 60Kg of candelilla wax per month, (considering that the average monthly production is 120kg of wax per person).

To analyse the results generated by the data collection process described above, the analysis includes a mixed qualitative-quantitative methodology. The quantitative method was used to process the ratings (from 1 to 4) obtained for each aspect (calculating average scores per dimension) in order to map the results. This was undertaken to provide a picture of the general perception regarding each dimension and was translated in the Rural Web chart (Figure 6.2), as explained in the sections below. The analysis was complemented

with a qualitative analysis using the additional information obtained from the interviews and the informal conversations. The respondents provided specific comments on the questions described in Annex 6.1.

Table 6.1. Actors interviewed during the Rural Web analysis

Actors	Characteristics
Candelilleros from Cuatrocienegas, Coahuila.	This region represents the oldest producers of candelilla wax. Contrary to the rest of the regions, these communities have shown continuous production over time. The *candelilleros* from this region currently represent up to 40% of the total wax production in Mexico.
Candelilleros from Parras, Coahuila.	This region is also a historic producer of candelilla wax. These communities have shown continuous production over time.
Candelilleros from Nuevo León	A newly re-activated producing region that, in the past, has shown discontinuous performance. However since the mid-2000s, it has shown an increasing production volume.
Candelilleros from Zacatecas	This region, similar to Nuevo Leon, showed a negative and discontinuous performance during the 1980s and 1990s. However, since the mid-2000s the communities have been re-activating the production of candelilla wax.
Forestry Government Agencies and Forestry Engineers	CONAFOR is the government forestry agency responsible for promoting and encouraging preservation and development of sustainable commerce for natural resources. It also provides socio-economic organization programs to create productive chains through the strengthening of social organizations and institutional capabilities, as well as by providing training in the adequate use of forestry resources, with the purpose of generating employment and income. Forestry Engineers are responsible for evaluating and analysing the natural resources present in the rural communities, working with rural communities and CONAFOR to develop the exploitation permits in order to ensure the proper utilization of biodiversity. (CONAFOR, 2012).
Universities and Research Institutions	Representatives from different local universities and research institutions were invited to participate in the evaluation process. The selection criteria were based on their experience in previous or current projects focused on the candelilla wax or its production process. The representatives evaluated belong to The National Commission for the Knowledge and Use of Biodiversity ´CONABIO'; Universidad Autónoma de San Luis Potosí; Universidad Autónoma de Coahuila and; the Research and Development department from a local private firm (Multiceras) which is currently running different projects focused on the improvement of the production process as well as for different applications of the wax. The interviewed actors are involved in different projects focusing on research about the properties of the

	plant, diversification of applications and research into methods to make the production process more efficient.
Municipal Authorities	In this region there is significant integration between *candelilleros* and municipal authorities. The representative of the municipal authority interviewed is a person with experience in the candelilla collection process and he represents the interests of the rural collectors at local government level.
Private Firm	This group includes collectors who are individuals located within the rural communities and generally work on a commission basis purchasing *cerote* for different private firms. This group also includes members from different departments (Sales, Agribusiness, and Social Responsibility) from a private firm that is recognized as the largest trader of candelilla wax.

6.5. Results

6.5.1 Sustainability

Sustainability was considered to be a critical dimension by all the actors interviewed. The dimension considered, for example, the continuity of the activity and the preservation of the resource over time. The group of *candelilleros* from the region of Cuatrocienegas and Nuevo León were more concerned about this dimension compared to the *candelilleros* from the other regions. Other groups concerned with performance in terms of this dimension were the representatives of the national and local forestry authorities. Their concern related to the knowledge and application of the officially recommended preservation measures and about the effectiveness of the reforestation campaigns. Nevertheless, respondents were generally optimistic about the survival of the practice over the next five to ten years, and had positive expectations for improvements to the activity and its value chain in the future, as well as a positive perception regarding the adequacy of bio-stocks of the plant in the region. For most actors interviewed, the main concern identified related to continuity for the current collectors over a period longer than 15 years. This is logical considering that the average age of the *candelilleros* ranges between 40 and 45 years. Moreover, another factor affecting continuity is the low number of young *candelilleros* available to maintain the practice in the future.

6.5.2 Novelty Production

It was observed that novelties are mainly expected to take place in relation to the collection and production process. The types of novelty observed in the process vary

according to the level of expertise and technological skills available. The concept of "Peasant Innovativeness" (Ventura and Milone, 2005; Oostindie and Broeckhuizen, 2008) is reflected in this case in the small improvements developed by *candelilleros* principally in relation to collection techniques and the production process. For example, using trucks or customized tools to collect and process the candelilla plant can be considered as small improvements that save both time and effort. The actors interviewed from universities, research institutes and private firms are less optimistic concerning the level of improvements, basically because their expectations in terms of product and production efficiency relies on the application of advanced technology.

Nevertheless, in this case, some technological improvements, such as new designs for processing equipment and furnaces, have been developed in recent years, principally focusing on improvements in production efficiency and working conditions for the *candelilleros*. These changes are currently in place and were developed based on local research supported principally by the Mexican government (CONAFOR 2008). Other research efforts were undertaken by the private firm Multiceras, which is currently working on three main objectives: to improve production efficiency and the production process and to search for new and improved product characteristics and applications (Multiceras 2013).

In order to increase the income of rural candelilla collectors, two projects were developed by the *candelilleros* from Cuatrocienegas, with support from the municipal authorities in cooperation with other national organizations. The projects involved the organization of workshops (in two different locations) to produce value added candelilla wax. However, when the representatives from the private firms and research institutes were asked if they were familiar with these projects, they stated that there was limited information about the projects mentioned and, moreover, they lacked basic information on matters such as production capacity, the capabilities of the production equipment or even the specifications of their final product. Nevertheless, the representatives showed an interest in this project, because it would allow the *candelilleros* to advance one further step in the value chain.

Other improvement projects were encouraged by different institutions such as Universidad de Coahuila, which along with the governmental agricultural agency 'SEMARNAT' and 'CONAFOR' developed a project to increase production efficiency

and improve safety in working areas. Finally, in relation to multi-functionality, as reported by the interviewed, different activities have being undertaken alongside agricultural-related activities, such as tourism and other cultural activities, principally in communities from Coahuila and Nuevo León (Secretaría de Cultura de Coahuila, 2013).

6.5.3 Endogeneity

The shared concerns with regard to this dimension relate to the general perception that *candelilleros* are heavily dependent on external actors to obtain the technology and specialized skills to increase the added value of their product.

Nevertheless, most of the interviewees recognize the capacity of *candelilleros* to transfer their knowledge and production skills from generation to generation, as well as their internal organizational skills to generate shared benefits. This is certainly the case in the communities from Coahuila. This is a location where stronger collaboration exists between the *candelilleros* and where the activity is more mature and extensive. Compared to the rest of the regions, Cuatrocienegas showed a higher level of organization between the community members to generate their own benefits and to provide added value to the product. At the time of this research, there were some ongoing rural development projects through productive chains, encouraged by municipal and national support agencies (CONAFOR 2012).

Another peculiarity that distinguishes Cuatrocienegas is the larger presence of candelilla wax buying private firms. This situation provides *candelilleros* with greater negotiation power, which gives them more influence as a recognized group of producers. As already indicated, the local municipal authorities from Cuatrocienegas are closely involved in the interests and wellbeing of the *candelilleros* as a group. Notwithstanding their organizational strength, the group of *candelilleros* from Cuatrocienegas agreed that they are heavily dependent on third parties or government officials to provide them with production equipment and tools. When they were asked about the possible reasons for that dependency, they argued that for them it is more beneficial to keep receiving the tools from the buyers and save costs, as well as to avoid possible conflicts of interest by using common equipment and utilities. In general, of all the groups interviewed, the Research Institutes and the Private Firms were least optimistic about this dimension. Their main

concerns related to the high level of dependency on external actors to obtain production equipment, the motivation to undertake the activity and the limited value added.

6.5.4 Social Capital

The groups interviewed all agreed on the high level of cooperation and support that exists between members of the same community (as shown in Figure 6.2). Rural communities are organized through community assemblies known as "*Comisariado*", which are formed by the members of the community. The common activities developed in the community are first discussed between the members of the assembly and approved based on general acceptance. However, although there is a lot of cooperation between *candelilleros* from the same community, limited cooperation was reported between members of different communities.

The *Comisariado* is the local institution responsible for promoting the common benefit of all the members of a given rural community, including those who are not *candelilleros* but who still have a voice and a vote concerning the activities developed within the premises and the communities. The *comisariado* would take the role of mediator between the different interests, establishing measures to negotiate the best possible outcomes for all the actors in the community.

On the other hand, some rural collectors mentioned cases where youngsters, who had left the community and moved to larger cities to work in factories or the construction industry, had returned after a couple of months and re-engaged in candelilla collection. They argued that this occurs because in the city there are additional expenses such as rent and transport, and the cost of food tends to be much higher compared to the prices at the communitarian stores. These youngsters did not take such costs into consideration when making their decision to relocate. In the words of one of the interviewees: "Here [rural community] you don't need to pay anything to go to work, you just wake up early in the morning and go…" "The collector is his own boss, knows how many hours he wants to work, or if he takes a day off," "If he needs extra money, he just works harder and that's it".

6.5.5 New Institutional Arrangements

Detected as a main improvement opportunity, this dimension, as shown in figure 6.2, was perceived to be the most negative by all the respondents. The general concern is based on the discontinuity and the limited relationship between the *candelilleros* and the local governments, Universities and Research Institutes. The strongest institutional relationships were observed between the *candellileros* and the private firms, principally because of their working relationship which represents, for the *candelilleros*, their main source of income and supply of production equipment. However, with the exception of the above mentioned case of Multiceras, in most cases the relationship with private firms is limited to the selling-purchasing process. As observed during the fieldwork period, Cuatrocienegas has a higher number of producers, compared to the rest of the regions, and attracts support from government and research institutes, both at local and national level, for improvement projects focused on infrastructure and social organization. This situation is not reflected in the rest of the candelilla communities due to the lower number of producers.

6.5.6 Market Governance

All the interviewees agreed that there is scope for improvement in terms of this dimension, principally for the market governance capacity of rural actors which is mainly determined by the influence of the members at later stages of the value chain. Concerning the influence of the *candelilleros* on the selling price of *cerote*, which is the candelilla wax in its simplest form, the rural producers from all the areas have a more positive perception, compared to the opinion of the rest of the actors interviewed. The general perception of the *candelilleros* is that they can somehow influence the selling price by trading their product with the different private companies that purchase the candelilla Wax. However, the actors interviewed from research institutes, universities, government representatives and private firms believe that *candelilleros* have limited influence on the selling price and state that the price is relates more to external factors such as global demand and variability in the selling price of competing and substitute natural wax products. In terms of the supply of candelilla wax, the analysis evaluated the feasibility for a *candelillero* to produce an additional quantity of candelilla wax on top of what he is currently producing. In the short term, and considering the current working conditions, available tools and technology, an additional 10kg of candelilla wax per month was

perceived as feasible. However, perceptions were less optimistic concerning the feasibility of producing larger additional quantities (e.g. 30kg extra). Producing an extra 60kg was regarded as impracticable, under the current conditions; and respondents suggested that some improvements in the process should be made to achieve this.

With respect to the demand, the average perception was that it was highly feasible for private firms to purchase an extra 10kg or 30kg. However, in terms of a scenario involving an increase in supply by 60kg in the short term, the results varied considerably between the different actors interviewed. While the general perception among the *candelilleros* was that the market can afford the purchase of this additional quantity, the rest of the actors – principally the private firms – regarded this scenario as less feasible, arguing that an extra 60kg would represent a 50% rise in the total volume of candelilla wax available in the global market, which would create the problem of overstocking. According to the comments from firm representatives, an increment in the available volume of wax should be accompanied by a marketing strategy in order to place the additional volume within new markets or increase the number of product applications, in order to create a balance between supply and demand.

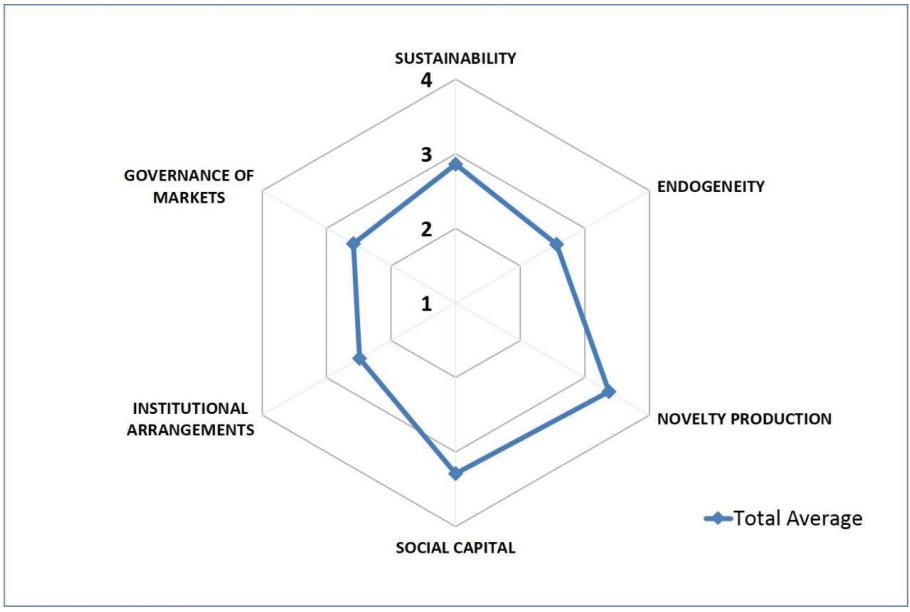

Figure 6.2. Rural Web results from the interviewed actors.

Source: Calculated by authors based on the results obtained from surveys.

Note: The graphic presented in figure 6.2 is for illustrative purposes only. It was included to provide a visual reference about the total average of rates per dimension, as reported by the interviewed actors. The figure aims to facilitate the analysis of the dimensions and its relevance in accordance to the evaluated concepts. It does not intend to provide a quantitative analysis of the results.

6.6. Discussion

6.6.1 The Rural Web Analysis framework

As shown in the previous sections, the Rural Web analysis framework allowed gaining insight about the social complexity and interaction between different members of a value chain. The framework enabled to understand different perspectives on the potential of candelilla production. The results obtained showed territory-specific peculiarities of the region and the economic activities that are based on the utilization of the local natural resource, as addressed by van der Ploeg and Marsden (2008) and Marsden (2010).

Identification of all the actors involved at a regional level is important for the complete assessment of a value chain. Linear-traditional value chain analysis usually considers only those actors who participate actively in the product lifecycle (from seeding, collection and processing of raw materials to industrial processing, distribution and trading of final value added goods). All actors considered in linear analysis interact in the process and provide a specific value to the product. On the other hand, the Rural Web analysis framework provides insights from the aforementioned 'value adding' actors, but also from those who are not actively involved in the process, such as Universities, Research Institutes, and Government representatives. These external actors do not provide a tangible value to the product; however they could have a significant impact on the value chain performance (Gregoratti, 2011; Tallontire et al. 2011; Bitzer and Arts 2013). They could potentially limit its growth, and in some cases, hinder it completely by applying external impacts to the process.

As shown in the results section, the concerns from the different groups in terms of the dimensions evaluated were quite different: while dimensions such as Social capital and Novelty production obtained more optimistic perceptions, dimensions such as New institutional arrangements, Endogeneity and Governance of markets received less optimistic answers. However, the purpose of using the Rural Web is not to take actions

to improve these perceptions, because positive changes in one dimension might have a negative effect on other dimensions. On the contrary, it is more about understanding the peculiarities of the situation and acting according to its characteristics. It is important to bear in mind that this is a snapshot of the perceptions obtained from current actors. Situations are dynamic and could be modified based on the common dialog and understanding of the actors involved. The analysis framework presented could facilitate the generation of a diagnostic relating to the potential risks and improvement opportunities that must be addressed from the actors' perspective in order to develop a successful dialogue and the understanding to generate efficient development strategies.

6.6.2 Findings from the case study

Improvements in the socio-economic wellbeing of disadvantaged areas can best be brought about by recognizing and encouraging the collective resources of a territory itself (Ray, 2000). Therefore this section analyses the main differences found in the perceptions of the actors interviewed. Then, the latter were linked to existing literature in order to provide specific recommendations and promote a common understanding of each one's point of view. Such common understanding would form a baseline to identify risks and maximize strengths for each dimension in order to address further development strategies.

In terms of *Novelty Production*, given that there is a marked difference between the perception of *candelilleros* compared to the rest of the actors interviewed, a common dialog must be encouraged between all parties in order to understand that novelties are largely a deviation from the rule and generally do not correspond with the knowledge accumulated to date (van der Ploeg et al., 2006:200). Such a dialog would allow them to identify the 'Contextual knowledge' (Oostindie and Broekhuizen, 2008) generated by the accumulation of technological capabilities and skills from each region.

As observed, most improvements reported by the *candelilleros* consist of small changes to production and collection techniques, generally on a territorial basis, which result in a steady but ongoing increase in benefits, while for the rest of the actors (principally private firms, research institutes and universities) the expected outcomes are linked more to improvements in efficiency and capacity building in relation to the production process. In this case, identifying the differences in concepts among all parties would enable the dissemination of knowledge throughout different territories (Oostindie and Broekhuizen,

2008). Another observation was that standardization and dissemination of new production and preservation techniques encouraged by private firms, governments and universities faced limitations due to the highly localized novelty production that exists within the rural communities. Shared understanding and communication would allow all parties to potentiate the possible outcomes from novelty production such as: Improving resources; Fine tuning; Boundary shifts; and Re-patterning resource use (Ventura and Millone, 2005).

When applying development initiatives, it is important to consider the traditional territory-specific incentives that people deploy to regulate themselves, such as, for example: solidarity, reciprocity, reputation, personal pride, respect, retribution and vengeance (Bowles and Gintis 2002, Gray et al. 2014). In the case of *Social Capital* and *Endogeneity*, the stakeholders involved should encourage the development of a 'collective efficacy' (Sampson et al. 1999, Bellandi 2001, Anderson and Jack 2002) in order to foster cooperation between communities within the same territory in a hands-on approach.

As described above, the limited communication and interaction between communities complicates the implementation of territorial and regional development projects. In general, *candelilleros* perceive themselves as an organized community that follows a territorial-individualistic working philosophy. However, from the different regions, it is only in Cuatrocienegas that sufficient organizational skills have been developed to create an impact group sufficient to generate common benefits on a regional basis. For the rest, the working relationships have been on an individualistic basis, considering 'Community-specific' needs. As identified by co-actors, this individualistic culture generates a lack of efficiency in the distribution of resources (such as equipment, tools, technical skills etc.). In this case, cooperation between the members from different communities should be encouraged through working relationships based on 'Trust' (Bowles and Gintis 2002, Durlauf 2002, Bitzer et al. 2013). Trust could act like a lubricant that, in this case, would enable a more efficient distribution of knowledge and resources throughout different territories (Fukuyama 1999).

In terms of *Sustainability*, the main concern from all those interviewed, is the low number of young *candelilleros* who would undertake the activity in the future. For this reason, current improvement projects include the integration of youngsters in the production

process. Awareness about the official recommendations for preservation is high, since most rural actors argued that they have received talks and training about it. However, when put into practice, in most cases the recommendations appeared inefficient, in view of the conditions where the activity is undertaken. Therefore, rural actors have come up with their own preservation techniques focusing on land distribution and collection patterns, alternating collection in order to let the plant re-grow. These collection schemes are respected by all rural members of the community and are regulated by the Comisariado for each rural community. In order to integrate the rest of the actors into the preservation measurements proposed by the *candelilleros*, it is necessary to understand the constraints they experience in their daily activities, and from this, construct mechanisms to generate effective preservation of the natural resource. As suggested by Boettke et al. (2008), in order for formal institutions, to "stick" with the regular working process, it must be mapped onto the informal rules.

With respect to *New Institutional Arrangements*, a stronger interaction between all actors in the value chain should be encouraged, in order to maximize rural development opportunities. *Candelilleros* from most regions agreed about the limited relationship that exists with research institutes and Municipal authorities. Actors should migrate from the traditional style of support into a more active role (Shucksmith 2010). The first step in establishing effective institutional arrangements is to establish, monitor and enforce rules. Since every region currently works on a territorial-individualistic basis, it is understood that some differences could be encountered between regions (Barret et al. 2001).

Finally, in terms of *Market Governance*, Non-Rural actors agreed that *candelilleros* have a certain influence on the selling price. However, this influence is limited within certain price boundaries, because the purchase price relates more to external factors such as global demand and variability in the selling price of competing and substitute wax products, such as Carnauba wax. In order for the *candelilleros* to advance in the value chain, it is necessary to foster the conditions needed to meet the requirements for technical skills and equipment; and to improve working conditions. This could be accomplished by integrating all the members of the value chain within Multi-institutional networks to encourage the active participation of producers, consumers, local institutions, NGOs and related organizations (Marsden and Renting 2003, Ventura et al. 2008, Block et al. 2008, Shucksmith, 2010, Tallontire 2011).

As commented, a key element to ensure the proper relationship between developing actors (including private firms) and rural producers is the knowledge of regional characteristics. This regional knowledge also contributes to the success of integrated rural development projects. In a traditional analysis of a value chain, the lack of raw material would detonate in actions to encourage production by different means, such as to increase the number of production sites, improve production yield through technology innovation or to hire more labour force. However when working with small and medium sized rural producers, there is no such thing as a direct relationship of simply produce more product. There are relevant aspects that need to be assessed prior to encourage economic activities with such producers. Through this framework it was possible to identify the pattern of interactions, exchanges and mutual externalities within the different groups involved in the candelilla wax value chain.

The outcomes from the Rural Web analysis included information about communication and cooperation systems based on trust among the evaluated members; the main concerns about the process' sustainability due to the relatively low number of young producers and the proper resource preservation techniques; the current limited collaboration between institutions and rural producers; as well as to the different concerns about the market governance and the proper development of the value chain. The information generated by the proposed tool confirmed the theory from van der Ploeg et al. (2008) about the differences that exist between the different actors in terms of their web. It also helped to explain their particularities, as well as to foresee the possible development trajectory.

The discussion about the dialog and opportunities to increase understanding, in the results section of this chapter, was elaborated upon based on the observations and comments received from different actors during the interview process. These might serve as a baseline for the actors involved to define improvement strategies (Block et al. 2008, Gregoratti 2011, Messely et al 2013). However, the suggested recommendations might only be useful once the interests of each actor are fulfilled or when a common trade-off between all parties is agreed upon. As addressed by van der Ploeg et al. (2000), synergy is a strategic element in many rural development experiences. It creates cohesion between activities, not only at farm level but also between different regions and other rural activities.

6.6.3 Unfolding the Rural Web of the candelilla wax value chain

As described by Messely et al. (2013), regionalized rural development is grounded in, and driven by, complex sets of internal and external interactions, which shape the relative attractiveness and competitiveness of rural spaces economically, socially, culturally and environmentally. This section reviewed the interaction flow of the actors within the dimensions described in order to "unfold" the Rural Web (Van der Ploeg and Marsden 2008, Marsden 2010) of the candelilla wax value chain and thereby to understand the development trajectory of the case under analysis, as shown in figure 6.3.

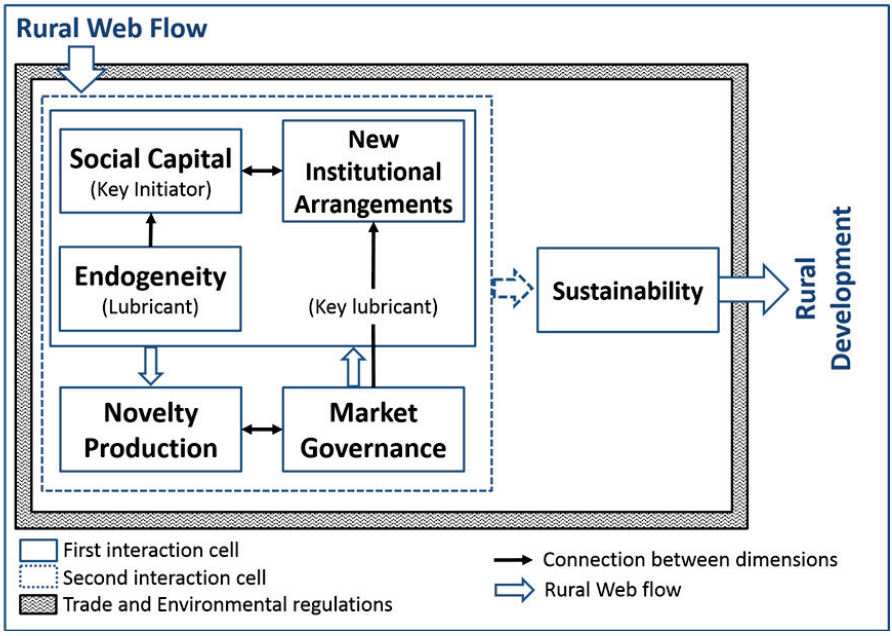

Figure 6.3. Unfolding the Rural Web

Source: Developed by authors based on the results obtained from surveys.

Based on the findings from the empirical research, the Rural Web flow begins with an interaction cell comprising the dimensions of Social capital, New institutional arrangements and Endogeneity. This first cell represents the main interaction block, where Social capital, as the key initiator, plays an important role in the development process because, as explained above, it represents the strongest dimension of the web due to the closed interaction and relationship between the rural producers from the same community (bonding capacity). This dimension has been identified as a key initiator

because its' bonding capacity facilitates the development of relationships between the community members and externals. Although the relationship with other communities was rather weak, the relationship among the members was strong enough to facilitate negotiations with the rest of the project members. In the analysed case, the initial approach and negotiations were made between members from each community and the private firm. In line with the observed culture and traditions from the rural producers, the negotiations and agreements were performed according to the local interests. According to the comments from the interviewed actors, the agreements on price, volume, and other criteria for a given community might be different from those for a neighbouring community, even when dealing with the same company and selling the same product. In this same cell Endogeneity acts as a lubricant for Social capital, principally because of the consensus that exists among the actors interviewed about the value of local resources and traditional know-how concerning the production of natural goods (i.e. candelilla wax), as well as the observed capabilities to bring about common benefits and endogenous development (i.e. the community of Cuatrocienegas which demonstrated a higher level of organization as well as development initiatives).

Influenced by the first interaction cell, Novelty production would be determined according to the relationship from the previous dimensions, which are defined by the members of the value chain and shaped according to their interests. As shown in this case, novelty varied according to the available resources and the objectives pursued by each group. Acting as a key lubricant and directly linked to Novelty production, is Market governance. This dimension serves as a base for the value chain, providing resources and income opportunities to the interacting actors. It must be said that, contrary to Social capital and Endogeneity which are somehow a constant element of this web, Market governance varies according to the economic activity encouraged. It also influences the New institutional arrangements, which will be configured according to the economic activity encouraged and the rest of the dimensions from the first interaction cell (i.e. the type of organizations interacting within the value chain varies according to the available resources, traditions, regulations, economic activity, and others). The relationship between the previously mentioned dimensions comprised a second interaction cell, represented in figure 6.3 with a dotted line.

The interactions between the dimensions analysed, along with the trade and environmental regulations that frame the entire Rural Web, have a direct effect on

Sustainability which, in turn, is determined according to the actors involved, the natural goods selected for utilization and their preservation, as well as the sector of the population available to process them. This interaction flow as a whole leads to rural development as an outcome.

6.6.4 Challenges and limitations of the Rural Web as value chain analysis framework

The observations from Messely et al. (2013) with regard to the need of a regional learning process as a prerequisite for the application of the Rural Web were confirmed with our experience with the candelilla value chain. To minimize the limitations, maximize its outcome, and get familiar with the dimensions and functions of the Rural Web analysis, it is recommended that private firms receive support from social scientists, NGOs or local representatives with sufficient regional knowledge. Their support would facilitate a proper understanding of the communities, open dialog channels and would provide sufficient input to the stakeholders to guarantee the successful use of the Rural Web.

During the case study, additional to the previously mentioned support, a valuable contribution from regional actors was received during the development of the questionnaire: providing important recommendations about local language, expressions, wording, and current paradigms present within the evaluated communities. In our experience, additional to the pre-requisite of regional knowledge, it is relevant for those interested to apply the Rural Web, to generate a preliminary evaluation about key concepts such as: i) authority and hierarchy levels within the communities; ii) identification of local formal and informal leaders; iii) trust and perception from rural producers concerning the stakeholders involved and; iv) interest of rural producers to participate in the value chain, which for some might represent a change from another economic activity and learn new techniques and processes. The previous concepts were found relevant to secure the successful application of the Rural Web. However there might be more concepts that shall be considered, which opens an opportunity for further research work and analysis.

6.7. Conclusions

The Rural Web analysis framework provided relevant information about territory specific characteristics of the evaluated rural producers. The information provided includes insights of the local governance system, official and unofficial leadership structures and

the type of incentives traditionally applied by the rural producers. This information is relevant for developing actors because it serves as baseline to delineate their strategies to encourage the participation of rural actors in specific economic activities and integrated development projects.

The present research focused on the analysis of a value chain based on the commercialization of natural goods by independent small and medium rural producers that are obtaining improvement opportunities and benefits from integrating their operations along the value chain in a sustainable way. Based on the results obtained it is believed that the Rural Web framework is suitable for analysing the socio-economic configuration of value chains whose early stages are based on small and medium size rural actors, principally because it identifies the social relations that occur at different dimensions, which in turn could foster or hinder its success. However, given the characteristics and complexity from each value chain in relation to its product, production process, distribution channels and markets, this work opens possible pathways for further research about the applicability of the Rural Web framework for other types of value chain.

Chapter 7: Assessment of expenditure behaviour of rural communities. Use of an economic simulation game to evaluate potential effects of social investment on rural development

Abstract

As described in chapter 2, the ultimate goal of integrated rural development projects is to support rural development and create benefits for actors involved. Rural households, additionally to the acquisition of skills, technology, strategic relationships and resources, are expected to be able to generate surplus income as a result of sustainable economic activities and the collaboration with the other relevant actors (private firms, civil organizations, governmental representatives, etc.). Such surplus income is expected to be used in part for communitarian investments or for the acquisition of goods that can contribute to livelihood improvements. However, a common concern of researchers and development specialists is the efficiency of aid distribution and the possible effects of social investments. Empirical evidence shows examples of how aid and surplus money have not always been used for development purposes as expected. Moreover, since in most cases, the expected benefits are hypothetical at the early stages of a projects, it is very difficult for developers to foresee how rural households would use the mentioned resources. The present chapter includes an empirical exploration of an economic simulation game to assess potential expenditure behaviour of rural communities. The analysis aims to predict how surplus income obtained would be used by the rural families involved. The main interest behind the experiment was to anticipate whether they would acquire assets or goods that in turn would generate future returns to improve their living conditions in the medium and long-term, as well as whether they are inclined to collaborate on the development of communitarian goods like clinics, schools, social spaces, among others.

7.1. Introduction

The present research was performed as part of the integrated rural development project encouraged by private firms, governmental institutions and civil organizations described in chapter five. As explained, this project focused on generating development opportunities through sustainable economic activities. The project considered the active participation of rural communities to foster their own socio-economic development, taking a leading role in the decision making process related to the use of their income according to their main needs and interests, as well as deciding whether to participate or not in communitarian improvement strategies.

To date a large extension of literature exists that explains the positive contributions of multidisciplinary groups on development of rural areas. Publications explore the contributions from group activities on remote rural areas where the community members are allowed to have greater control over their own development, opening new economic activities and empowering people to determine their own priorities for improvement. However, some questions about the efficiency of aid distribution and the link between aid flows and growth remain unclear in the mind of researchers, policy makers and development agents (Collier and Dollar, 2002; Hansen and Tarp, 2000; Jayne et al., 2001; Lyon, 2003; Doucouliagos and Paldam, 2009). Government and development agencies have for instance been grappling for decades with how to design and implement food aid programs in developing countries (Jayne et al., 2001). A factor that affects the efficiency of aid distribution and generation of improvements through multidisciplinary groups, is the willingness of community members to collaborate in communitarian strategies. In some cases individual short-term self-maximizing behaviour affects cooperation, groups as such might not work unless the individuals are convinced that they would have a personal benefit (Kamara and Kargbo, 1999; Lyon, 2003).

Aid distributors have traditionally been reluctant to provide cash to beneficiaries. An important motivation behind this reluctance was the belief that beneficiaries would spent it on immediate consumption goods (Riddell, 2007; De Hoop et al., 2010). In their paper, De Hoop et al. (2010) tested the assumption that transferring cash to beneficiaries would result in low investment in local public goods with long term benefits (De Hoop et al., 2010). Granting decision making power regarding the provisioning of public goods to beneficiaries is considered favourably, because the goods selected by the beneficiaries

should more closely reflect the preferences of the population they are meant to serve (Hoddinott, 2002; Lyon, 2003; Kilby, 2006; Ostrander, 2007; De Hoop et al., 2010). Community driven development initiatives in which beneficiary communities have direct control over management of investment funds show that the channelling of decision making power to beneficiaries can, under the right circumstances, improve quality of projects (Mansuri and Rao, 2004). A contingent valuation in Nepal for example showed that both beneficiaries and non-beneficiaries have a positive willingness to pay for health promotion programmes (Borghi and Jan, 2008). A key element for the success of multi-institutional development groups relies on the proper identification of the motivating factors, which in turn, would encourage each actor to get involved in common development strategies (Giessen and Böcher, 2008; Dutrénit, 2012).

This chapter was developed to investigate how surplus income generated through an integrated rural development project would be used by the rural families involved. The project members (in particular representatives from the private firm and governmental institutions) where interested to anticipate on whether the rural population would execute 'positive expenditures' with their surplus money. In this setting 'positive expenditure' was defined as the type of purchases or acquisitions of assets that would generate future returns which improve the living conditions of the community in the medium and long-term, as well as expenditures that incentivize the collaboration on the development of communitarian goods like clinics, schools, social spaces, among others. The concern about the use of money is based on the above mentioned literature about aid distribution efficiency, as well as on literature that describes problems of monetary transfer schemes in populations that have no proper education and mentoring about the efficient use of money (De Hoop et al., 2010). Moreover, within the project there was knowledge of previous negative experiences with other projects in neighbouring rural communities (not-related), in which large amounts of monetary transfers and payments for services or land had generated disadvantaged situations for the rural population, principally due to their lack of economic education. It was reported that beneficiaries spent their income on goods to fulfil immediate needs, most of them non-durable goods. They were found to invest only a small amount in the acquisition of assets that keep producing economic returns and long term benefits, as well as in communitarian investments on public infrastructure. 7 to 10 years after the reported transactions, the beneficiary communities were facing poverty problems again.

Most methodologies to evaluate expenditure behaviour are based on historical data (Caeiro et al, 2012; Upadhyay and Pathania, 2013; Barret et al., 2013; Donni and Chiappori, 2011; Su and Flessa, 2013). Barret et al. (2013) explain different expenditure surveys utilised in countries like USA, Australia and Canada. The methodologies vary in size and configuration, but have in common the use of a diary by each household to record each expenditure during a given time (from two weeks to twelve months) in order to collect comprehensive information on household expenditures, along with household income and wealth. Since the focus of this study is on a new intervention, the benefits of the project are at this point only theoretical and no representative historical data is available yet. Therefore it was not possible to analyse ex-post the expenditure behaviour of the targeted communities. As an alternative a tool and model was developed to predict how rural households would apply the expected income. Based on applied literature (discussed in the section below) and empirical information from the analysed case, a specific model has been designed and applied to simulate different situations that could be faced in real life by the rural inhabitants in order to mimic their expenditure behaviour and obtain an idea of the potential use that they foresee of the expected new income.

The chapter is divided into four more sections, in which, section 7.2 explains the sample used to test the proposed tool, the theoretical and empirical background used to design the proposed simulation game, as well as the methodology applied during its empirical utilization. Section 7.3 describes the main results obtained during its applications and finally sections 7.4 and 7.5 include the discussion and conclusion sections respectively.

7.2. Methodology

7.2.1. Empirical case study and sample description

The empirical research was performed among the rural communities from the 'Chihuahuan Desert' in northern Mexico, selected as case study as explained in chapter 5. The sample contained 48 members (36 women and 12 men) from 6 rural communities from a region located in the Mexican northern state of Nuevo León: Icamole, El Milagro, Carricitos, El Delgado, Las Presas and San Antonio de Arista from the municipalities of García and Mina respectively. The average age of the interviewed persons is 39 years old, in which the youngest participant was 19 years old and the eldest 63. The sample include the 10 members of the candelilla wax production cooperatives described in chapter 5. From the

12 men evaluated, just two of them are not part of the aforementioned cooperatives. Additionally, the sample include family members from the mentioned producers, as well as other members from the selected communities. In order to secure the repetitiveness of the sample, all the members from the aforementioned communities were invited, considering that in the future new members could be included in the cooperatives. The present sample includes all the participants that responded to the invitation. The data collection was performed in the mentioned communities during July and August 2014.

7.2.2 Design of simulation game

As described above a main concern of the participating project members during the early stages of the project was to determine the patterns of expenditure behaviour within the targeted rural communities. Since the income after the intervention was expected to be higher in comparison to the regular income at that given time, the main challenge was to determine future consumption behaviour. Most expenditure behaviour models base their analysis on historical data relying on statistics from previous months and sometimes years (Caeiro et al, 2012; Upadhyay and Pathania, 2013; Barret et al., 2013; Donni and Chiappori, 2013; Su and Flessa, 2013). This study uses a simulation game which was developed based on applied literature with respect to saving and expenditure simulation games, as well as previous knowledge of the region. The purpose was to assess correctly the expenditure preferences, according to the particular traditions, customs, available resources and shown preferences (goods and assets already present in some communities).

The design of the simulation game was based on the research of different authors such as Otto et al. (2006) and Sonuga-Barke and Webley (1993), who used board games to assess saving behaviour of children. During their simulation games, the players received tokens as they were advancing positions in the board. Children were expected to accumulate the necessary amount of tokens in order to buy a desired price (generally a toy). Also during these games, researchers provided certain real life situations as well as ‘temptations’ to children on which they could spend their tokens instead of saving. The experiments were designed to determine children’s level of commitment with saving, as well as to assess the different drivers and motivations behind savings. Along this line, an additional factor was integrated in the simulation model by Otto et al. (2006), who added “uncertainty” to the model in order to investigate to what extent children of different ages plan their saving in situations of income uncertainty.

The studies that only focuses on out-of-the pocket expenditure may underestimate the total cost incurred in households, because they cannot measure the indirect cost of economic consequences of reduced productivity such as absence from work and disability due to diseases. In order to value the time lost by the participants due to illness in monetary terms, the analysis includes a mix of methodologies such as current wage rate, willingness to pay and household average income, as explained by Su and Flessa (2013).

In order to test the willingness of rural producers to engage in communitarian investments, the design was based on the research work of De Hoop et al. (2010) and Cardenas and Carpenter (2008). The proposed model includes a version of a simulation experiment known as the Voluntary Contribution Mechanism 'VCM' (Cardenas and Carpenter, 2008). The VCM experiment is played in a repeated number of rounds and allows players to contribute to a public good, so by deciding whether to cooperate or not. This model also considers the payment of benefits for those players involved in communitarian investments, emulating the long-term benefits that are obtained through this type of investments (De Hoop et al., 2010).

The proposed simulation game consist in a board game with a dice, where different situations occurring along the route mimicking real life situations and in which participants have to take spending/saving and investment decisions. The game is played in groups where each participant alternates taking turns to roll the dice and to advance its chip the corresponding amount of cells in the board game (illustrated in Figure 7.1). Each time that a participant moves its chip, receives a certain amount of notes according to the advanced cells, which represents the "salary" perceived during that turn. Each turn, the players have the option to use their money for different purposes, such as the purchase of a good, acquiring an insurance plan, transferring money to a saving account or contributing to a common investment (described in detail section 7.2.4).

7.2.3 Real life factors

In order to identify and understand the potential expenditure decisions and strategies of rural inhabitants under different circumstances, different factors were included in the game which simulated real life situations. The factors included a definition of different initial capitals for each participant, a list of unexpected events which could be positive or negative situations, as well as different expenditure opportunities.

Similar to real life, each player has the possibility to be involved in a development project with different economic circumstances, therefore, different initial capitals are assigned at random to each participant. The initial capital in the game simulates previous savings, properties and goods that a participant could have before participating in the project or a cooperative scheme. The main interest of assigning an initial capital was to understand the possible behaviour that a person may present if certain "financial security" is perceived by having a buffer.

The buying behaviour of the rural consumers is influenced by several factors including the efforts on the part of sellers and exposure to media (Upadhyay and Pathania, 2013). During the game the participants were offered with different expenditure options. The main objective was to simulate the media and marketing campaigns that in real life encourage consumption. The participants were continuously informed about the products available in the shopping catalogue, as well as the saving options and common investment opportunities. Each expenditure option has a monetary cost that the participant has to pay to the bank for its acquisition. In order to stimulate the consumption of products each product has also a monetary benefit in return. This benefit simulates the motivation or utility that a person receives when acquiring a given product. It might be interpreted as the sense of satisfaction that a person develops when using their earned money. The monetary benefits per purchased good are described in table 7.1.

Table 7.1. Shopping catalogue

Product	Picture	Cost (MU)	Retribution (MU)
Consumer goods /clothing		4	2
Bicycle		8	2
Radio / Sound System		12	2
Small TV		12	2

Refrigerator		16	4
Large TV		16	4
Sofa		18	4
Kitchen		20	4
Home improvement		24	6
Motorcycle		24	6
Truck		36	4

During the game, each participant was offered to engage in a communitarian investment. These options represent the construction of infrastructure for the community. The type of communitarian investments available were infrastructure projects such as building a school, paved roads, improvement of water , green energy and gas supply and are dedicated to the improvement of the general living conditions of the community. These projects are only developed if all the participants in the game cooperate with an equal payment to cover the cost of the good. The investment options represent a cost for the participants, but also offer a retribution due to the concept of productivity improvement along with a reduction of the cost of living. The cost of goods as well as the benefits that each of the projects give to the participants are described in table 7.2. The main purpose of including this option was to identify the willingness of participants to participate in community investments.

Table 7.2. Types of Community Investments

Common good available	Cost of Good	Retribution per turn
Construction / Improvement of School	8	4
Construction / Improvement of Clinic	8	4
Improvement of Production equipment	16	8
Improvement / const. of Roads	16	8
Water supply infrastructure	16	8
Gas Supply	20	8
Solar Energy	20	8
The payment of good was executed only once and the retribution to the participants was paid every turn		

As previously explained, a series of unexpected events can be included in a simulation game. The kind of events that are considered include negative situations like “Natural disasters”, “Death/Illness of donkey”, “Home/Car Repair” and ” Others”, as well as positive events like unexpected income. Each negative situation has a different value in terms of weeks, which represents the amount of money that is required to fix this problem or the amount of weeks that a participant misses work due to it. The cost of illness was calculated considering the time that the person would lose if a certain situation was experienced. In general the type of events cost a relatively high amounts of weeks, considering the probability of occurrence and the possible indirect costs that they could involve. As addressed by different authors (Wyss et al, 2001; Su and Flessa, 2013) household indirect cost are generally considerably higher than the direct costs of life. In order to identify the willingness of participants to prevent the cost of illness, the game included an expenditure option for health insurance. The health insurance provides the opportunity to affront health emergencies and diseases, reducing the costs of medical treatment and generating a retribution for productivity improvement. Contrary to the

previous investments, this is an individual option. The benefits of having insurance are described in table 7.3.

The positive unexpected events include activities related to leisure. These activities are related to happiness and distraction for the person or his family. Within this category are included “Birthday celebrations”, “Fairs or town celebrations”, “Travels” and “Purchase of home appliances”. These situations have a cost for the participant, but different to the previous categories, provide also a retribution. The reason for the retribution is that they act as a motivation or a sense of happiness and with it the increment of productivity. The retribution will be paid once the current round of the game is completed. The costs and benefits from the unexpected events are described in table 7.3. Once the participant completed a round, the bank pays the respective dividends that were generated by the purchase of goods, savings or positive unexpected income. Each player received support from the staff of researchers on keeping track of each transaction such as income, deductions, purchases, savings, dividends and expenditures generated along the game. Records were kept on the defined form (Annex A) and used for further analysis. Every time that a participant moved the chip throughout the 12 cells of the board was recognized as a round. The game ended once all the participants completed three rounds.

Table 7.3. Types of Unexpected Events

Unexpected Event	Cost	Retribution (if applicable)
Natural Disaster	12	NA
Illness of Donkey	10	NA
Illness of Producer	12	6 (with insurance)
Illness of Wife / children	8	4 (with insurance)
House restorations	8	NA
Fair / Town Celebration	4	2
Unexpected travel	8	2
Unexpected income	NA	8
Unexpected income	NA	6
In case of retribution, it was paid at the end of the turn Cost of Insurance: 12 notes per turn		

7.2.4 Structure and directions of the simulation game

The material used for the simulation game is described in table 7.4. The game was played in groups of 2 to 5 persons. Before starting the game all the participants received from the staff of researchers a clear demonstration of the instructions and rules of the game. The players were told that this was a simulation of their use of money and they were expected

to behave as in real life. They were allowed to use their money to spend in goods, invest it or to save it, according to the different options. The players were also told that there was no winner or loser, and that the money was fictitious and no reward was provided for the one who accumulated the higher amount of money at the end of the game. After explaining the rules, the group played a trial round in order to get familiar with the system. Once the participants had a clear understanding of the game and the objective the actual experiment started. Information about the players, configuration of groups, and results are shown in Annex 7.1.

Table 7.4. Description of material used for the economic simulation game

Description	Quantity	Reference – Figure
Board with 12 different cells, numbered from 1 to 12	1	Figure 7.1
Regular hexagonal dice, numbered from 1 to 6	1	
Set of cards containing descriptions of "unexpected events"	1	Table 7.3
Set of cards containing options of "common investment"	1	Table 7.2
Notes with value of 4 monetary units "MU"	100 notes	
Notes with value of 2 monetary units "MU"	100 notes	
A set of chips	1 / player	
Shopping catalogue of products to be purchased by the players during the game	1	Table 7.1

Each participant alternated taking turns to roll the dice and to advance its chip the corresponding amount of cells, according to the number on the dice. Each participant received certain amount of notes which represented the initial capital that each player had prior to begin the game. The amount of initial capital was calculated by multiplying by 4 the number obtained in the dice (i.e. if the player obtained a number 5 in the dice, he/she received 20 monetary units MU).

The player who obtained the highest number during the assignation of the initial capital began the game by rolling the dice again and moving the chip the corresponding amount of cells. Each cell represent a working period of four weeks. The player received from the bank a salary according to the number of cells advanced. The bank paid to the player a corresponding amount of salary after a predefined deduction that represented the cost of living (50%). For instance, in a case that a player had thrown four with the dice, he/she would had earned 16 MU, but instead, the bank paid only 8 MU to the player by deducing automatically the corresponding 50%.

Each turn, the players had the option to use their money for different purposes, such as purchase a good, transfer the money to a saving account or contribute to a common investment. The researcher who played the role of the bank was in charge to offer the different options that were included in the shopping catalogue, as well as to offer the saving options to the players. The saving options contain different benefit packages according to the saved amount, as explained in table 7.5. Additionally, every turn the player had the option to encourage the rest of the players to develop a community investment. Each member could decide whether or not to participate in the acquisition of a community good. Common goods offered different benefits, as explained in table 7.2, and could only be developed if all the participants cooperate with the requested amount. The board included three cells with a text indicating "Unexpected Events" (figure 7.1). As commented in section 7.2.3, the player who arrived to this cells was requested to pick a card from a pile and fulfil the obligations or enjoy the benefits according to the type of unexpected event obtained (in table 7.3).

Table 7.5. Saving options and payment of retributions

Saved amount per turn	**Retribution at the end of the turn**
8-15	2
16-23	4
24-31	6
32-39	8
In case of amounts higher than 40, the subsequent calculations are based on the mentioned amounts. I.e. when the saver deposits 40 the total paid amount is: 10 (8 from range 32-39 + 2 from range 8).	

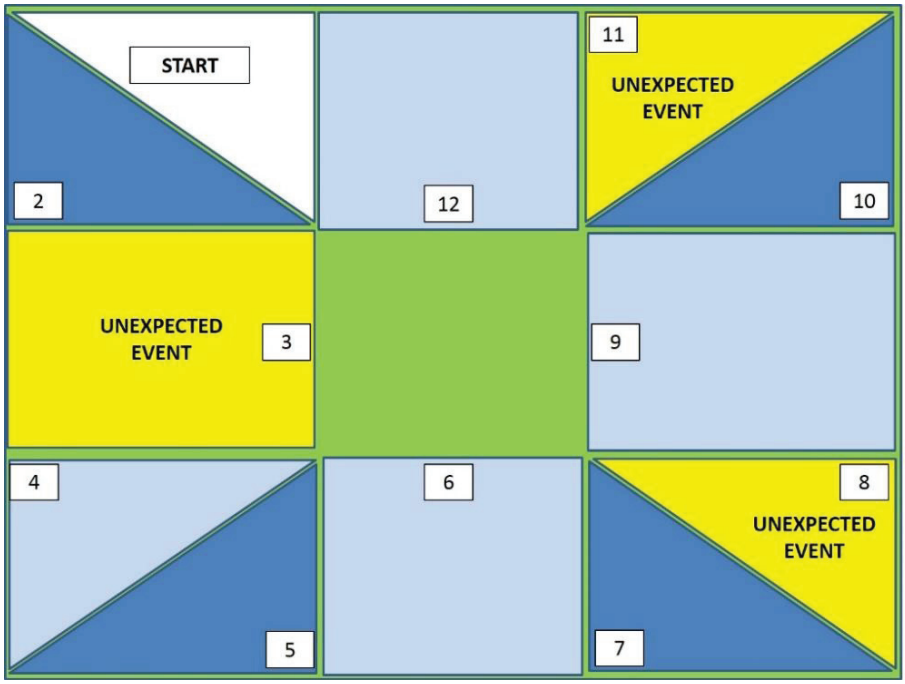

Figure 7.1. Economic Simulation – Game Board

7.2.5 Analytical framework

The decisions made by the participants related to the use of money were computed and analysed in the present chapter using two main analytical models: a Tobit model and a poisson regression model. Both models are described below.

7.2.5.1 The censored regression – Tobit model

Censoring of a range of values of a variable of interest introduces a distortion into conventional statistical results (Greene, 2003). Censoring is essentially a defect in the sample data. Presumably, if they were not censored, the data would be a representative sample from the population of interest. The relevant distribution theory for a censored variable is similar to that for a truncated one. It begins with the normal distribution and assumes that the censoring point is zero, although this is only a convenient normalization. To make the distribution integrate to one, it is scaled up by the probability that an observation in the untruncated population falls in the range that interests us. When data are censored, the distribution that applies to the sample data is a mixture of discrete and continuous distributions.

To analyse this distribution, a new random variable y transformed from the original one, y∗, is defined as

$$y = 0 \text{ if } y* \leq 0,$$
$$y = y* \text{ if } y* > 0.$$

The distribution that applies if $y* \sim N[\mu,\sigma 2]$ is $\text{Prob}(y = 0) = \text{Prob}(y* \leq 0) = (-\mu/\sigma) = 1 - (\mu/\sigma)$, and if $y* > 0$, then y has the density of y∗.

This distribution is a mixture of discrete and continuous parts. The total probability is one, as required, but instead of scaling the second part, we simply assign the full probability in the censored region to the censoring point, in this case, zero, as shown below.

If $y* \sim N[\mu,\sigma 2]$ and $y = a$ if $y* \leq a$ or else $y = y*$, then

$$E[y] = a + (1 -)(\mu + \sigma\lambda),$$

and

$$\text{Var}[y] = \sigma 2\ (1 -)[(1 - \delta) + (\alpha - \lambda)2],$$

where

$$[(a - \mu)/\sigma] = (\alpha) = \text{Prob}(y* \leq a) = , \lambda = \varphi/(1 -),$$

and

$$\delta = \lambda 2 - \lambda\alpha.$$

Proof: For the mean,

$$E[y] = \text{Prob}(y = a) \times E[y \mid y = a] + \text{Prob}(y > a) \times E[y \mid y > a]$$
$$= \text{Prob}(y* \leq a) \times a + \text{Prob}(y* > a) \times E[y* \mid y* > a]$$
$$= a + (1 -)(\mu + \sigma\lambda)$$

Applied in the present analysis, suppose that a person is willing to spend on the purchase of a durable good. For example, a car. In this case, one would observe the expenditures only if the car is bought, so

$$y_i* = x_i'\beta + ui \text{ if } y_i* > 0$$

where x_i denotes a vector of household characteristics, such as initial income, net income, unexpected event, etc., y_i^* is a latent variable, in this case the person is willing to spend on a car. We observe $y_i = y_i^*$ only if $y_i^* > 0$ and we set $y_i = 0$ if $y_i^* \leq 0$. The censoring at zero is of course arbitrary, and the u_i's are assumed to be IIN(0, σ2). This is known as the Tobit model (Tobin, 1958; Baltagi, 2011). In this case, we have censored observations since we do not observe any y∗ that is negative. All we observe is the fact that this household did not buy a car and a corresponding vector xi of household characteristics. Without loss of generality, we assume that the first n_1 observations have positive y_i^*'s and the remaining n0 = n−n1 observations have non-positive y_i^*'s.

The censored regression analysis in this chapter includes as dependant variable: expenditure options, using different independent variables like age, gender, net income, unexpected events and initial income (as explained in section 7.3).

7.2.5.2 The poisson regression model

Poisson regression is a form of regression analysis used to model count data and contingency tables. Poisson regression assumes the response variable Y has a Poisson distribution, and assumes the logarithm of its expected value can be modelled by a linear combination of unknown parameters. Poisson regression models are generalized linear models with the logarithm as the (canonical) link function, and the Poisson distribution function as the assumed probability distribution of the response.

The Poisson regression model specifies that each y_i s drawn from a Poisson population with parameter λ_i , which is related to the regressors x_i . The primary equation of the model is

$$\text{Prob}(Y = y_i \mid x_i) = e^{-\lambda_i} \lambda y_i / y_i! \text{ , } y_i = 0, 1, 2, \ldots$$

The most common formulation for λ_i is the loglinear model,

$$\ln \lambda_i = xi\beta.$$

It is easily shown that the expected number of events per period is given by

$$E [yi \mid xi] = Var[yi \mid xi] = \lambda i = exi\beta,$$

so

$$\partial E [y_i \mid x_i] / \partial xi = \lambda_i \beta.$$

7.3. Results

7.3.1 Use of saving systems

The expenditure decisions taken by the participants were recorded in the predefined format (Annex 7.2). Based on the results, the behaviour presented by each participant was analysed according to the different circumstances presented during the game. The present section includes a summary of the results obtained from all the participants of the simulation game.

A common saving behaviour was observed among the players. On average, the final balance that the players showed at the end of the game was 52 MU, with a minimum of 8 MU and a maximum of 110 MU. Moreover all the participants showed a positive balance during and at the end of the game. The participants kept during the game an average of 34 MU and at the end of the game they kept, in average, around 51% of their total income. From the 48 participants, a good majority (31 players) used the saving system. These players, on average, deposited in their saving accounts around 18% of their total income. With respect to the saving behaviour, 17 of the 31 users of the saving system deposited money in the first round (with an average deposit value of 10 MU). The average balance that the users presented before their first deposit was 27 MU. The rest of the users of the saving system (13 of 31) made a deposit in the second round, with an average t amount of 14 MU, at that time having an average balance of 32. There was only one player who deposited in the saving system in the third round. The deposited amount was 8 MU and the balance presented before the deposit was 48 MU.

Although not all the players used the proposed saving system, the majority of the players kept certain amount of money on hand in a form of "cash" as a saving system. On average, the 17 cash savers presented a positive balance and kept in liquid at the end of the game around 42% of their total income. As commented above, the game was played in groups, however each participant was independent from each other to make his/hers expenditure decisions and was also able to see the decisions taken by the rest of the group members. The saving behaviour within the members of a same group of players presented different outcomes. For instance, in seven out of the twelve groups there were players that did not use the saving system. Moreover, the deposited amount was different from each other. For example in group 1, in which only 50% of the participants used the saving system, the

difference between the highest deposited amount and the lowest was 2:1. In other cases like groups 5, 7 and 8 the difference was significantly higher.

7.3.2 Purchases of goods

The majority of the participants (39) performed purchases, most of them, in more than one occasion with on average 2.5 purchases per person. The average amount spent by the participants was 35 MU, and the average percentage of money spent in comparison to the total income was 32%, with minimum of 5% and maximum of 76% of the total income. From the 11 items available in the shopping catalogue (as shown in table 7.6), the most popular with 29% of the total volume of purchased goods was clothing and consumer goods. Other popular items were bicycles, trucks and motorcycles which were purchased by 17%, 15% and 11% of the participants respectively.

From the 39 players that performed a purchase, 18 of them purchased their first product during the first round. The average balance on their accounts before the first purchase was 31 MU with a minimum of 10 MU and a maximum of 46 MU. The average cost of the purchased good was 14.7 MU. The participants that performed their first purchase during the first round spent on average 29% of their total income, purchasing on average 2.4 goods per person during the three rounds. From these participants, 66% purchased during the game two or more goods with a maximum of 6 products.

17 players purchased goods during the second round. The average balance on their accounts before the first purchase was 39 MU with a minimum of 16 and a maximum of 68. The average cost of the first purchased good was 15.4 MU. The average percentage of capital spent on purchases within this group of participants was 37% of their total income. The participants that performed their first purchase during the second round acquired on average 2.7 goods. More than 76% of these players acquired two or more products, with a maximum of 5 goods. Only 4 players purchased their first good during the last round, showing an average balance of 61 MU on their accounts, with a minimum of 40 MU and a maximum of 92 MU. The average cost of the first purchased good was 21 MU and the average percentage of capital spent in purchases was 28% of their total income, purchasing on average 1.5 products. A Tobit analysis (table 7.7) was performed using purchases as dependent variable and variables like age, gender, net income, unexpected events and initial income as explanatory variables. From the mentioned variables, only Net income

presented significant effect on purchases. As observed, the more net income presented by the players, the more they purchased.

Like the use of the saving system, the purchasing behaviour of the participants within the groups was different. In five out of the twelve groups, there were participants that did not perform a purchase. Also the difference between the amounts of money spent was different. For instance, the ration between the highest and the lowest amount spent on purchases in 10 of the 12 groups was higher than 2:1. Moreover in 8 out of 12 the relationship was 4:1. Table 7.6 displays the purchased products that were more popular among the participants. In total 95 items were sold during the game. The top 5 products that reported more volume of sales (amount of pieces sold) were: clothing (29%), bicycles (17%), Trucks (15%), radios (11%), refrigerators (7%). However, the type of product purchased was different throughout the game. The results showed that during the first round the preference from buyers was different from the one identified in rounds two and three respectively. The top 5 purchased products during round 1 were: clothing (15 items), bicycles (7 items), radios (6 items), refrigerators (5 items) and trucks (5 items). Round two presented the highest volume of purchased items (total of 46 items), but the purchasing preference was different than the one reported in round 1. For instance during this round, less pieces of clothing were sold and other products like sofas, kitchens, TVs, trucks and motorcycles were bought more frequently.

Table 7.6. Amount of purchased goods per group of players

Table	Clothing / consum.	Bicycle	Truck	Radio	Sofa	Refrigerator	TV16	Kitchen	Moto	TV12	Home repair	Common. Invest.
Group 1	2	2	0	0	0	1	0	0	1	0	0	1
Group 2	4	1	0	0	0	0	0	0	0	0	0	2
Group 3	1	0	0	0	0	0	0	0	0	0	0	0
Group 4	2	2	0	0	0	0	0	0	0	0	0	0
Group 5	3	2	2	0	0	1	0	0	0	0	0	0
Group 6	2	1	4	2	0	0	1	0	0	0	0	0
Group 7	4	2	1	3	1	0	1	0	0	0	0	0
Group 8	0	2	3	0	0	0	0	1	0	0	0	0
Group 9	0	0	3	2	3	0	2	1	1	0	1	0
Group 10	0	2	1	0	1	2	1	1	0	1	0	0
Group 11	2	0	0	0	0	0	0	0	0	0	0	1
Group 12	8	2	0	3	1	2	0	1	1	1	0	1
TOTAL	**28**	**16**	**14**	**10**	**6**	**6**	**5**	**4**	**3**	**2**	**1**	**5**

Table 7.7. Tobit analysis using purchases as dependent variable.

Dependent variable: Purchases					
Variable	**Coefficient**	**Standard Error**	**b/St.Er.**	**P[|Z|>z]**	**Mean of X**
Constant	-56.412	33.125	-1.703	.089	
Age	.155	.360	.430	.668	39.292
Gender	-2.991	9.786	-.306	.759	.250
Initial Income	.610	.637	.958	.338	13.458
Unexpected Income	.051	.405	.127	.899	11.917
Net Income	.948	.364	2.604	.009	71.250
Disturbance standard deviation					
Sigma	26.731	3.152	8.480	.0000	

Source: Developed by authors based on the obtained information during field work.

As shown in table 7.8, a Tobit analysis was run for savings as dependent variable. The analysis includes the same independent variables evaluated in purchases (age, gender, initial income, unexpected events and net income). According to the results, contrary to purchases, none of the evaluated variables resulted significant for the saving actions.

Table 7.8. Tobit analysis using savings as dependent variable.

Dependent variable: Savings					
Variable	**Coefficient**	**Standard Error**	**b/St.Er.**	**P[|Z|>z]**	**Mean of X**
Constant	-9.218	29.840	-.309	.7574	
Age	-.215	.329	-.652	.5144	39.291
Gender	-3.655	8.888	-.411	.6809	.250
Initial Income	-.025	.579	-.044	.9650	13.458
Unexpected Income	-.328	.378	-.868	.3853	11.917
Net Income	.478	.326	1.466	.1426	71.250
Disturbance standard deviation					
Sigma	23.654	3.271	7.232	.000	

Source: Developed by authors based on the obtained information during field work.

7.3.3 Acquisition of an insurance plan

Another product available for the players was the acquisition of an insurance plan. This plan allowed the participants to reduce to half the cost of illness. This card was used in those cases when a participant received an unexpected event card with a certain illness. The insurance was valid only if it was acquired before the event. Participants were not allowed to purchase an insurance to reduce the cost of the illness at the same moment when the unexpected event was happening. It was a product that did not offered additional benefits or dividends at the end of the round. Also it was valid during a single round, if the participants completed one round, they were requested to acquire another plan if they wanted to keep insured. Same as an insurance plan in real life, it was only useful in case of an unexpected event occurring in reality.

The insurance plan was acquired in total by 18 of the 48 players. The average age of these participants was 39 years old, from which 73% were in ages below 50 years old. From these players, 10 of them acquired the insurance only once during the whole game, 6 acquired it twice and 2 acquired it during the three rounds. From the participants, 8 of them acquired the insurance during the first round, 7 in the second and 3 in the third round. The average balance that the players showed when acquiring the insurance for the first time in round 1 was 32 MU with a minimum of 22 MU and a maximum of 46 MU. The average balance of those who purchased at the second round was 37 MU with a minimum of 20 MU and a maximum of 54 MU. For those who acquired it during the third round the average balance was 50 with a minimum of 22 MU and a maximum of 78 MU. Among the players who acquired the insurance in the first round, 5 of them repeated the acquisition during the next rounds (3 during the second round and only 2 acquired at the third round). Repetition rate was lower within those who acquired the insurance at the second round. Three of the seven participants repeated the acquisition at the third round. From the players, the majority (72%), bought the insurance plan without an antecedent of illness. Only 28% of them acquired the insurance after experiencing an illness. Actually 55% of the participants who acquired the insurance, never experienced any illness during the whole game. According to a poisson regression analysis using as dependent variable the acquisition of insurance, the variables of initial income and unexpected events presented a relevant effect. In this case, the initial income presented a positive effect, as observed in table 7.9, the more initial income was reported by the participants the more they acquired an insurance plan. The opposite was observed with the variable of unexpected income, which in fact was negatively related, so the more they experienced other real life situations like natural disasters or unexpected payments, which were not covered by the insurance, the less they acquired the health protection insurance.

Table 7.9. Poisson regression analysis using insurance as dependent variable.

Dependent variable: Insurance					
Variable	**Coefficient**	**Standard Error**	**b/St.Er.**	**P[|Z|>z]**	**Mean of X**
Constant	-1.867	1.543	-1.210	.226	
Age	-.015	.019	-.828	.408	39.292
Gender	.654	.414	1.580	.114	.250
Initial Income	.063	.032	2.012	.044	13.458
Unexpected Income	-.0471	.021	-2.190	.028	11.917
Net Income	.018	.016	1.114	.265	71.250

Source: Developed by authors based on the obtained information during field work.

7.3.4 Communitarian investment

As commented above, also the option of communitarian investment was available for the participants. This option was included because of the aim of the analysed project (Chapter 5) which included the development of common goods as part of its outcomes. The communitarian investment option allowed them to generate a common improvement and enjoy its benefits in the form of dividends at the end of each round. Acquiring these goods was only possible if all the members of a group agreed to share the cost of the good. From the 12 groups five of them collaborated on common investments. From the five groups, only one generated two communitarian investments. The investment from the four groups who collaborated once was 8 MU, and the invested value of the group who collaborated twice was 36 MU. In total 16 participants from the five groups participated in communitarian investments. The average age of these participants was 35 years old, but 87.5% of them were younger than 42 years old. The type of communitarian investment generated by the participants were: School (2 units), Clinics (2 units), Production improvement (1 unit) and Water supply (1 unit).

Table 7.10 presents the results of a Tobit analysis using community investment as dependent variable. As shown the analysis again includes age, gender, net income, and initial capital as independent variables. The results indicate that the amount spent on community investments is significantly determined by the net income. As observed in the analysis, net income presented a positive effect on community investments. This means that players who have acquired more income during the game, were more willing to invest on common goods. Finally a correlation analysis was performed between community investment, savings and purchases (table 7.11). The results show the negative correlation between purchasing of goods presented and community investments. Thus the more players acquired other goods, the less they spent on communitarian investment, and vice versa. Similar effect was observed between savings and purchases.

Table 7.10. Tobit analysis using community investment as dependent variable.

Dependent variable: Community Investment					
Variable	**Coefficient**	**Standard Error**	**b/St.Er.**	**P[|Z|>z]**	**Mean of X**
Constant	-81.061	44.087	-1.839	.0660	
Age	.437	.458	.955	.3398	35.786
Gender	-2.511	6.845	-.367	.7137	.286
Net Income	1.035	.414	2.500	.0124	71.143
Initial Income	-.072	.545	-.132	.8953	14.143

Disturbance standard deviation					
Sigma	8.906	2.718	3.276	.001	

Source: Developed by authors based on the obtained information during field work.

Table 7.11. Table of correlations between savings, purchases and community investment

		SAV	Comm	Purch
SAV	Pearson Correlation	1	,006	-,257
	Sig. (2-tailed)		,967	,078
	N	48	48	48
Comm	Pearson Correlation	,006	1	-,198
	Sig. (2-tailed)	,967		,177
	N	48	48	48
Purch	Pearson Correlation	-,257	-,198	1
	Sig. (2-tailed)	,078	,177	
	N	48	48	48

7.3.5 Benefits and dividends from acquisitions

As commented, the use of the saving system, the purchase of goods and communitarian investments generated benefits for the players in the form of payment of dividends. Originally the use of these dividends was a strategy to encourage the consumption of the participants, but as seen during the experiment, the participants used them as a strategy to increase their income and, in some cases, as a form of saving. Results showed that more than 60% of the participants generated from 16% to 31% of their total income through the payment of benefits. Principally through the use of the saving system and the purchase of goods.

As commented, all the participants from the experiment presented a positive balance at the end of the game. Moreover, from the total 48 participants, 65% of them presented a final capital (including the value of the purchased goods) in a range of 2.2 to 7.7 times higher than their initial capital. 25% of the participants presented an increment on their initial capital in a range of 8 to 15 times, and the remaining 10% reported a final capital 15 to 26 times higher than their initial capital.

7.4. Discussion

7.4.1 Learnings from the experiment

Among the different findings from the analysed results, the saving culture from the participants was one of the most significant. The participants were explained that although

they were able to accumulate money throughout the game, it was not the main objective. Moreover, they were explained that the amount of money at the end of the game was not an indication of winning or losing. However saving behaviour was observed among the players, even with some keeping their cash as a saving system. In general, the results showed a responsible use of money by all the participants.

The saving option from the experiment presented relevant information about the psychology behind saving strategies (Wärneryd, 1999), as well as the spending behaviour of the participants. As reported, the average balance before the first saving deposit was 27MU, compared to the average balance of 31MU that was reported before their first purchase. The same holds for other expenditure options like community investments and acquisition of insurance plan with average balances above 32MU before the first acquisition. However savings showed to have two main purposes. Firstly, as reported by the majority, they save to keep a buffer amount of money to solve unexpected events. The second purpose, which was very popular among the participants, was to save a determined amount, in order to acquire certain goods. Participants showed a committed behaviour towards the acquisition of specific goods. As observed, the average value of the first purchased good was 14.7MU, which correspond to products from the mid-high range of products from the shopping catalogue.

As commented, there were players that did not use the available saving system, and who preferred to keep their money in cash. Similar to the experiment from Otto et al (2006), some players (in his experiment children from 6 to 9 years old) perceived none or limited utility in using the bank saving system due to their limited experience with the use of a banking system in real life. In the present case, the participants were all adults, but in most cases they also presented limited or null experience with the use of banking system and deposits. Their saving system in real life is made in cash, as is reflected by the majority of the players. However, for 65% of the players the saving system offered a way to keep their money safe from spending, while generating benefits. When the reason behind the use of the saving system was asked, around 80% of the participants commented that they used it just because it generated benefits. When they were asked about the possibility of having spent the money if they kept it on hand, they replied that they would not spend it before reaching the price of the desired good and also being able to keep some buffer. The buffer saving behaviour was a common practice among the players, as observed in the results on which in average 51% of the total income generated by the participants was kept as a buffer

saving practice. As found in the experiment of Carroll and Samwick (1997), a high degree of income uncertainty leads to stronger buffer saving. Similar to the present experiment, income fluctuations led to a higher sense of uncertainty, and with this to a stronger buffer saving behaviour.

The purchase of goods was a popular strategy observed among the participants. As shown in the results, 81% of the players purchased on average 2.5 products during the game. Theory about expenditure behaviour express that the purchasing decisions are mainly influenced by factors such as socio-economic conditions, cultural environment, literacy level, occupation, geographical location, efforts on the part of sellers, exposure to media, etc. (Upadhyay and Pathania, 2013). During the simulation game the players were constantly offered different products from the shopping catalogue, however most of the participants presented a well-defined preference for desired products. The most popular products among the players, as shown above, were clothing and consumer goods like bikes, trucks and motorcycles. Apart from consumer goods, the rest of the products were actually assets that in real life are used for their work and are perceived with a real value for their daily lives. The option of consumer goods was observed to be used as a form of investment among the players. Instead of depositing their money on the bank, frequently the players were observed to purchase one or more pieces of clothing and consumer goods because it represented at the end of the round benefits in the form of monetary returns.

Expenditure behaviour literature identifies a commonly observed change in household consumption preferences as the level of income increases. As evidenced in the research from Upadhyay and Pathina (2013), a positive relation between household income and consumption was observed in India. During a certain period of time, as the economy increased, the percentage share of food expenditure decreased and non-food expenditure increased. Similar pattern was observed in Gao et al. (1996) where Chinese households restrain food consumption in order to make cash available for building new houses and acquire consumer durables. As observed our results, the value of the purchased products of the players acquiring products in the second round was higher than the average value of the article purchased by those during the first round. The same was observed with those players who purchased their first good in the third round: when taking place in the third round the average value of the first purchased good was higher (21 MU), than the average price of the goods purchased during second and first round. The average balance of the players during the second and third rounds was higher and it allowed them to choose more

expensive goods. Moreover, the results showed a difference in the purchasing preference of the players. As shown, during the second and third rounds, in which the average balance of the players was higher, more expensive goods were acquired.

As described in the introduction of this chapter, there exists some reluctance among aid specialists and in applied literature against providing cash to beneficiaries. The general though is that beneficiaries would spent it on immediate consumption goods instead of generating local public goods with long term benefits (Riddell, 2007; De Hoop et al., 2010). The present research tested the strategy of granting decision making power regarding the generation of public goods (Hoddinott, 2002; Kilby, 2006; Ostrander, 2007; De Hoop et al., 2010). The main objective was to test the theory from Mansuri and Rao (2004), who state that community driven development initiatives in which beneficiary communities have direct control over the management of the investment funds can, under the right circumstances, improve quality of projects. However, generally the community members present problems contributing with the creation of common goods. Public good problems are characterized by situations in which individual self-interest is at odds with group interest (De Hoop et al., 2010). In the present empirical research the contribution to community investments, as shown in the results, was performed by only 34% of the participants. This results coincide with the theory from Ledyard (1995) about voluntary contribution. He referred that in linear public good games the contribution on community investment generally lies between 40 and 60% of the group optimum. Additional to the variables explained above, another factor explaining the community investment behaviour was that those players investing came from the communities who invested in common goods and were actually familiar with the concept. Moreover, the type of goods selected reflected the preferences from the communities. The type of goods selected were actual needs from the communities.

7.4.2 Recommendations for integrated rural development strategies

Relevant information related to the potential expenditure behaviour from the evaluated participants was obtained from the experiment. This information can be used by development agents and the actors involved as an input for the design of strategies to encourage the referred ‘positive expenditure’. As observed, the participants presented a generalized saving behaviour, the majority using the proposed saving system and the rest through cash savings. The participants decided to save prior to doing other things with their

money. When asked about the reason why they deposited certain amounts of money or retained them in cash, the players answered that it was to prevent possible future needs and to purchase a desired good from the shopping catalogue. This is relevant information for developers because it helps to understand how these rural inhabitants would use additional income. As observed, acquisitions were driven principally by self-interests through individual choices with relatively low influence from the rest of the group members. The latter according to the expenditure decisions in terms of type of acquired goods and the amount of money spent/saved which showed different patterns among the members of a same group.

Recommendations for developers to define effective measures to encourage 'positive expenditure' include to provide rural inhabitants with sufficient information explaining the benefits of investing their money in durable goods that could provide future benefits for their families and communities. This information could direct the decision making process of the rural inhabitants towards community benefits, along with their individual benefit. The challenge for developers would be to facilitate the resources and the means necessary to fulfil the needs of the rural population without imposing specific behaviours. Although some conditions should be met in relation to specific obligations from the commercial relationship, it should be kept in mind that the participation from rural actors in integrated rural development strategies should be in a deliberate form. As commented in Chapter 3, the participation of the actors involved in IRD should be developed through a common dialog and with respect for each other's' decisions. When some inhabitants decide, for instance, to spend their money on non-durable goods, the rest of the actors should respect their decision and, in turn try to provide sufficient information to at least encourage his/her participation in community investments.

The preventive behaviour from the evaluated participants, additionally to the mentioned saving methods, was also observed through the acquisition of insurance plans. From the 48 evaluated participants, 38% of them reported at least one acquisition. From these, the majority bought the insurance without an antecedent of illness. This evidences the general sense of prevention from the evaluated participants. This information was actually confirmed with the behaviour presented by the producers collaborating in the integrated rural development project. As commented in chapter five (section 5.3.3), among the intended benefits from the producers include the acquisition of social security protection and pension funds. The results provided strategic input for the proper design of

methodologies to encourage positive expenditures. The recommendation for developers is to facilitate the means necessary to provide the insurance and pension systems for the participants. According to the statistical results from the correlation analysis, the participants would be interested to limit their purchases in order to acquire such services. The interest was actually demonstrated by participants from both genders and from all ages. This pledges for a positive response from the participants in relation to the strategy to promote positive expenditures.

Another expenditure option analysed was the generation of common goods. This option was less popular among the participants, however one third of them decided to perform community investment. The type of acquired goods, actually reflects their real interest, as they invested in the construction of schools, which as described in section 5.3.3, was the type of community investments performed by the rural producers during the last years of the project. As previously described, the sense of security provided by the amount of buffer capital was an important driver for the participants to invest in common goods. The more money they had during the game, the more investments were generated. This result is relevant for developers because the provision of means and surplus income could lead to the generation of theses goods. However, the recommendation for all the actors involved (including rural stakeholders) is to promote proper dialog channels in order to communicate the benefits of such common goods, but also the obligations and responsibilities inherent to their development. The lessons about social structures and interrelation among the community members (discussed in chapter 6), could result useful to establish the proper mechanisms of cooperation and communication among the actors involved.

7.4.3 Limitations from the experiment

For aid practitioners and sociologists interested on replicate this experiment, it is important to consider that the products included in the experiment and their cost should be defined in relation to the actual products present at the evaluated communities. In the experiment, the products were chosen based on previous regional knowledge about the people, local customs and available goods. For instance, the cost of the most expensive good (truck = 36MU) was calculated in relation to the possible income generated within a period of 1.5 years (1.5 rounds of the game). In real life this is the average value of the type of vehicles that *candelilleros* usually acquire (pre-owned vehicles).

Other important fact is that the original approach from the authors about this experiment was in relation to IRD philosophy in which the creation of common goods is expected. The discussion part appears to be somehow normative favouring collective organizations. Individualistic consumption behaviour is of course as positive collective, however in this case, the aid practitioners require collective work in order to facilitate social investment and the creation of common infrastructure and services to improve their living conditions. Ultimately the experiment was shown capable to identify different types of expenditure behaviour. The interpretation of the obtained results relies on the experimenter according to the pursued interests.

An additional recommendation related to the methodological aspect of the experiment is to amply the sample size and include, if possible, members of the same family taking expenditure decisions, in order to improve its representativeness, so the observed results could be confirmed and extended.

7.5 Limitations from the experiment

For aid practitioners and sociologists interested to replicate this experiment, it is important to consider that the products included in the experiment and their cost should be defined in relation to the actual products present within the evaluated communities. In the experiment, the products were chosen based on personal knowledge about the people, local customs and available goods. The cost of the most expensive good (truck = 36MU) was calculated in relation to the possible income generated within a period of 1.5 years (1.5 rounds of the game). In real life this is the average value of the type of pre-owned vehicles that the farmers usually acquire.

Another important fact is that the original approach from the authors about this experiment was in relation to IRD philosophy in which the creation of common goods is expected. The discussion part appears to be somehow normative favouring collective organizations. In this case, the aid practitioners require collective work in order to facilitate social investment and the creation of common infrastructure and services to improve their living conditions. Ultimately the experiment was shown to be capable to identify different types of expenditure behaviour. The interpretation of the obtained results relies on the experimenter according to the pursued interests.

An additional recommendation related to the methodological aspect of the experiment is to increase the sample size and to include, if possible, members of the same family taking expenditure decisions, in order to improve its representativeness, so the observed results could be confirmed and extended.

7.6 Conclusion

As described in chapters 2 and 5, part of the outcomes from IRD projects include the generation of surplus income for the rural families, as a result of their sustainable economic activities and the collaboration with the rest of the relevant actors. The analysis developed in this chapter aimed to answer how this hypothetical surplus income would be used by the beneficiaries. The analysis also looked for a mean to anticipate whether rural commoners would acquire assets or goods that in turn would generate future returns to improve their living conditions in the medium and long-term. For these purposes a board game was developed.

As shown, the study presented a complete involvement from the participants in the game. Each of the players used at least one of the options for consumption and/or savings, and interacted with the rest of the players. In general the real life situations included in the simulation game and the options presented for consumption and savings allowed the simulation of possible situations that the participants could experience in their daily life. The simulation game facilitated the assessment of potential future expenditure behaviour from the sample of rural inhabitants, considering a theoretical surplus income. It provided an outlook on the possible utilization of a surplus income, as well as identifying the interests within the selected communities in developing communitarian goods like clinics, schools, social spaces, and others. The results from the board game provide relevant information to developers about the possible use of income, which in fact showed congruent results according the actual expenditure behaviour from the analysed rural producers. The identified uses of money include a generalized saving and preventing attitude, as well as a particular interest to save money to acquire specific goods. The experiment also facilitated the development of specific recommendations for the actors involved. This recommendations were complemented with the information generated in the previous chapters in order to define dialog channels with rural actors, to identify specific drivers and motivating factors and to provide mentorship and access to financial tools that would encourage an expenditure behaviour that is able to break poverty cycles.

Chapter 8: General Conclusions

8.1 Recapitulation of research design and objectives

In line with the dissertation's main objective, the previous chapters have assessed empirically whether, from the perspective of private firms, integrated rural development is a feasible paradigm to target sustainable development. This thesis was organized into three parts, as described in section 1.4. The first part included two chapters: chapter 2 with an analysis based on literature concerning the benefits and challenges of IRD; and chapter 3 which offered a theoretical and empirical analysis about the potential role of CSR in rural development. The results from this part supported our hypothesis that private firms from different industries and countries consider CSR to be a strong driver for participation in IRD projects. These results also provided the theoretical background for the other parts included in the thesis.

The second part tested the IRD concept in the case study. Also composed by two chapters, it included chapter 4 which described the selected case study (the candelilla wax value chain); and chapter 5 which provided an empirical exploration of the ongoing IRD project in the case study area. This part provided the description of the value chain selected for the empirical case, the different actors involved in the value chain, and the socio-economic situation of the assessed communities from the Chihuahuan Desert. The insights from part one were used to determine the challenges and drivers from the actors involved in an ongoing IRD project based on the candelilla wax value chain.

The third part of this dissertation combined the information from the previous parts to analyse the impact of IRD on the selected rural communities. This part contained two chapters: chapter 6, which tested the applicability of the rural web framework to analyse the socio-economic configuration of a value chain based on natural goods. Chapter 7 tested a microeconomic simulation game developed to assess potential use of income and the potential effect of IRD on the assessed rural communities. The results from this part included an assessment of the different linkages and relationships that occur between the relevant actors on different dimensions of the social, environmental and economic aspects of the case study. These linkages and relationships are relevant to facilitate the interaction of the actors involved in IRD. The results also gave insight into the possible expenditure and saving behaviour from the rural candelilla producers. The results showed their

commitment to acquire medium and long-term benefits for their own self-development, and their interest in developing common goods to contribute towards their future wellbeing.

Finally, this chapter concludes with a recapitulation of the hypotheses that were tested in this thesis, as well as the information that intends to answer the research questions according to the proposed sub-objectives. This chapter also includes a reflection of the thesis's contribution to scientific literature, and theoretical and practical policy recommendations related to the analysed concepts.

8.1.1 Sub-Objective: To assess the interests and drivers that encourage participation by relevant actors in integrated rural development strategies

The hypothesis related to IRD expressed that its' success relies on the proper identification of the motivating factors that would encourage each actor to get actively involved in rural development. The analysis of literature presented in chapter two, provided an insight into the main factors that could encourage or in some cases discourage the participation of different actors in rural development. In line with the same hypothesis, chapter five tested for the selected case study, which was described in chapter 4, the integration of the presented actors towards rural development. As shown, the theoretical and the empirical findings presented similar results. The main benefits and challenges found in literature, were also identified by the interviewed actors in the presented empirical case. Both chapters (2 and 5) showed that IRD strategies represent a functional opportunity for improvement, once the interests and differences between the actors involved are managed at the point that a general trade-off and agreement is achieved. For instance, the main challenges for rural producers include to commit on the responsibilities and obligations inherent to the project, as well as to participate in communitarian activities. The benefits, as shown in chapter five, included access to technology and skills, as well as improvement of their working and living conditions, additionally to the benefits generated for their families and communities. For private firms that depend on material benefits and tangible results, challenges were identified related to deal with activities beyond their business scope and the long periods of time that it takes to generate tangible benefits from IRD projects. However, results from the empirical analysis confirmed the key motivating factors to engage in such strategies identified in literature. These motivating factors include strengthening of the value chains, securing continuous supply

of raw material, developing a multi-level network, generating a positive social image and offering means to collaborate with key stakeholders through Corporate Social Responsibility.

8.1.2 Sub-Objective: To explore how corporate social responsibility is currently applied with respect to rural development

As stated above, the hypothesis related to Corporate Social Responsibility stated that CSR represents a feasible driver for private firms to support rural development and that the main challenge relies on encouraging higher participation of firms in order to extend the amount of aid designated to rural development. The involvement of firms requires them to find the strategies best fitting their business models and interests. Chapter three presented both an analysis of literature as an empirical research that aimed to explore how private firms from a variety of industries and countries are currently undertaking CSR strategies oriented towards rural development. Among the strategies discovered in chapter three there are : the dialog with rural communities and local institutions, training and knowledge transference, strategies oriented towards the preservation of natural resources, financial contribution for infrastructure and economic development. Chapter 3 also revealed different motivations behind the participation of private firms. These include enhancement of firms' competitive advantage, increment staff's morale, cost-reductions, risk management, among others. As commented, although rural development does not suit all types of companies, managers interested to support rural development through their CSR strategies could use the presented strategies as reference when designing their own strategies, considering of course, their particular needs.

8.1.3 Sub-Objective: To assess the socio-economic configuration and the main linkages, constraints and drivers that facilitate or hinder the integration of natural resource value chains

Chapter 6 contains the exploration of a framework, known as the rural web, to assess the socio-economic aspects of natural goods' value chains. This chapter also includes an application of the proposed tool on the case study. As shown in the results, the rural web appears to be suitable for assessing the socio-economic configuration of value chains whose early stages are based on small and medium size rural producers. As found in the application, dialog between the actors involved and understanding of the relations that

occur at different dimensions of a value chain were two of the key elements that contribute to the successful development of value chains. Chapter 6 also included an exploration of the main linkages, constrains and drivers that facilitate or hinder the integration of private firms with small rural producers in the analysed empirical case study

Given the positive findings from the empirical test, the presented work opens possible pathways for further research about the applicability of the Rural Web framework for other types of value chains, given the characteristics and complexity that each value chain exhibits in relation to its product, production process, distribution channels and markets.

8.1.4 Sub-objective: To assess the potential expenditure behaviour of rural communities and to evaluate the potential effects of social investments on rural development

Once the different actors of the value chain have found sufficient motivation to participate in integrated rural development projects, and have overcome the challenges and constrains that this strategies represent, it is still not clear whether the generated individual benefits would create a positive effect on the targeted rural communities. As hypothesised, a critical part of understanding the interests of rural commoners is to assess the potential use of the money generated by rural development projects. Understanding the potential use of money would provide development agencies, private firms and governments an insight in whether assets would be acquired to improve their living conditions in the medium and long-term.

Chapter 7 provided describes and applies an economic simulation game to assess the expenditure behaviour of rural communities. The simulation game facilitated the assessment of potential future expenditure behaviour from the tested rural commoners, considering a theoretical surplus income. It provided an outlook on the possible utilization of a surplus income, as well as to identify the interest from the selected communities to develop communitarian goods like clinics, schools, social spaces, and others. The knowledge generated through such economic simulation game could also serve to define dialog channels with rural actors in order to provide mentorship and access to financial tools that could encourage an expenditure behaviour which succeeds in breaking poverty cycles.

8.2 Contributions to scientific literature

- This dissertation provides an innovative look at the IRD concept by considering the perspective of private firms; in this way the feasibility of integrating firms in rural development approaches is assessed (Chapter 2). It also improves the current empirical knowledge about the benefits and challenges faced by the involved actors when collaborating in IRD projects (Chapter 5).
- This dissertation gives insight into the role CSR initiatives can play as driver for private firms to collaborate in rural development (Chapter 3).
- This dissertation proposes an innovative application of the rural web framework as a socio-economic analysis tool for value chains based on natural goods (Chapter 6).
- This dissertation introduces a microeconomic simulation game to assess potential expenditure behaviour of rural communities (Chapter 7).

8.3 Policy implications

The thesis demonstrated that Integrated Rural Development can be a workable rural development strategy. However, there are certain practical implications that need to be considered by the actors involved when applying such a strategy.

- For actors involved in IRD, it is recommended to consider the characteristics, conditions, and preservation measures of available local resources. It is important to evaluate the possible risks and to define proper mechanisms to guarantee rational utilization and to ensure permanence of these resources (Ruttan, 1984; Cohen, 1989; Shortfall and Shucksmith, 1998; Murdoch, 2010).

- The inclusion of territorial culture generally motivates local actors to participate actively and with full commitment in IRD (Saraceno, 1995; Murdoch, 2000; Giessen and Böcher, 2008). Literature advocates the relevance of adjusting regulations and criteria according to regional-specific characteristics, resources and social-spatial configurations (D'Silva and Raza, 1980; Nemes, 2005; Giessen and Böcher, 2008; Giessen and Böcher, 2009).

- The collaboration of multi-institutional actors generally provide a better understanding about the different interests and approaches from all the parties involved (De Janvry, 1975; Lowe et al., 1998; Murdoch, 2000; Ray, 2000).

- A common understanding and agreement on key performance indicators and control measures could ensure the proper management of IRD projects. Private firms could perform a key role in this task, principally because of their experience in the use and application of performance indicators and efficiency measurement tools (Cohen, 1989; OECD, 1996; Ray, 1997;; Giessen and Böcher, 2008).

- Dialog channels should be defined among the actors involved in order to facilitate communication and understanding on each other's interests and needs.

- Proper communication and understanding of community concerns facilitates the integration process and enables the maximization of available resources by tackling specific needs (Freeman and Liedtka, 1991; Martin, 2002; Kemp, 2012). As reported by the analysed companies in chapter 3 and in the case study of chapter 5, the establishment of mechanisms to facilitate dialogs has significant results for their integration with local communities.

- For private firms, a key element to ensure positive results in rural development initiatives, is the involvement of top management in order to align the strategies according to the business scope. Benefits from their involvement include motivation of their teams and provision of resources (Parket and Eilbirt, 1975; Cruz, 2009; Kemp, 2012). As reported by the evaluated firms in chapter 3, a common way to facilitate the proper management of CSR related strategies is delegating its follow-up and operation to a specific person or group of persons (depending to a great extent on the resources and time available). In the empirical case of chapter 5, the activities were developed by members of the sustainability and social responsibility team, with a close follow-up and involvement of the CEO and the company's owner

- An ideal measure to maximize resources and to increase the scope of development projects is through cooperation with key stakeholders like governments and civil organizations (Hemphill, 1997; Li, 2012, Ma, 2012; Sharmin et al., 2014). Dialogue between the relevant actors and an understanding of the relationships that occur at different dimensions of a value chain, are two of the key elements that contribute to successful development. The rural web framework presented in chapter 6 appears to be a suitable tool for analysing the socio-economic configuration of value chains. As reported by the analysed firms in chapter 6 and the case from chapter 5, the multi-institutional

interaction benefited companies by having access to governmental incentives, as well as to advisory services from rural development specialists and NGOs which facilitated the effective and efficient use of available resources

- A critical part of understanding the interests of the rural population is to get insight into the potential use of the benefits generated by rural development projects. It is relevant for development agencies, private firms and governments to know whether the rural population would acquire assets to improve their living conditions in the medium and long-term. This knowledge would also serve to define dialogue channels to provide mentorship and access to financial tools that would encourage expenditure behaviour that could help to break the poverty cycle or instigate the development of community goods such as clinics, schools, social spaces, among others.

- Act local, start with small projects. The number of beneficiaries and size of projects depends mainly on the available budget and the institutions involved. However, as expressed by the analysed companies, in order to ensure positive outcomes, it is necessary to keep a close follow up and management of the deployed activities. Due to the stakeholders having limited available resources, it is recommended to break down the intended development projects in different stages, in which the first stages include a reduced number of beneficiaries, to measure its performance and learn during the implementation process to improve its application in subsequent stages.

8.3 Limitations and further research

This thesis has considered the collaboration of private firms with rural stakeholders and other institutions to generate rural development. This was done through an assessment of policies, development strategies and applied literature, as well as with an empirical assessment. For the latter data was collected from relevant actors from private sector, rural commoners, governmental institutions, universities and research centres, civil organizations and other stakeholders. As a direct consequence of the objectives and methods used, the works faces some limitations which open a window of opportunity for further research.

First, the selected empirical case is based on rural producers of the species *Euphorbia antisyphilitica* – Candelilla. The main reasons for the selection of the candelilla's value chain for the study case were the acquaintance of the author with this value chain, the

accessibility to these rural communities, the business potential of this value chain and the initiation of an IRD project within this chain. However, as commented in chapter four, in the same region there are other species that are currently collected and processed for commercial purposes such as *Agave lechuguilla* and *Lippia graveolens*, as well as others species that are not currently traded but could present potential market opportunity. Since the mentioned species have different value chains and trade characteristics, this would provide an opportunity for further research about their potential contribution to rural development and the possible combination with the production of candelilla wax.

Secondly, as commented, the presented research in chapter 3 does not pursuit to judge or evaluate whether the intentions behind the CSR strategies analysed are negative or positive, neither to assess the accuracy of the reported results in terms of monetary transfer or beneficiaries. The focus was on evaluating the reports from the selected companies in order to identify the type of firms encouraging rural development and the approaches they take.

Thirdly, in order to minimize the limitations and maximize the outcomes from the utilization of the rural web analysis, additional to the pre-requisite of regional knowledge, it is necessary to generate a preliminary evaluation of key concepts like authority and hierarchy levels within the community. Local formal and informal leaders should be identified, the trust and perception of rural producers with respect to the involved stakeholders should be gauged and the level of interest of rural producers to participate in the proposed value chain should be assessed. Furthermore other concepts might also be relevant according to the specific case. Therefore, as commented, further research related to this topic is needed.

Furthermore given its characteristics and complexity, the applicability of the rural web framework seems to primarily fit value chains whose early stages are based on small and medium size rural producers. Further research is needed to see whether its application to other types of value chains could also add to improvement of value chain performance.

Finally, while some trends with respect to the future expenditure behaviour and some insights in the applicability of the proposed simulation game could already be established, the sample size was limited. In addition with a larger sample size the effect of socio-

economic independent variables could also have been assessed. Further testing of the game, also in other contexts, would therefore be interesting.

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Annexes

Annex 3.1. Companies included in the sample of 100 firms from all the listed industry sectors

#	Name	Type	Sector	Country	Participant since
1	YPF S.A.	Public Company	Oil & Gas Processing	Argentina	26/10/2005
2	Carboclor S.A.	Private Company	Oil & Gas Processing	Argentina	18/06/2010
3	Xstrata Pachon S.A.	Subsidiary	Mining	Argentina	14/07/2010
4	Bertora & Asociados	Private Company	Financial Services	Argentina	01/10/2010
5	Parex Klaukol S.A.	Private Company	Construction	Argentina	21/10/2010
6	Ferva S.A.	Private Company	Construction	Argentina	11/05/2011
7	Animana Trading S.A.	Private Company	Personal Goods	Argentina	20/06/2011
8	Seguridad Integral Emp...	Private Company	Support Services	Argentina	11/10/2011
9	Santa Fe Associates In...	Private Company	Financial Services	Argentina	23/11/2011
10	SA San Miguel A.G.I.C....	Private Company	Food Producers	Argentina	06/09/2012
11	BANCO FIE S.A.	Private Company	Financial Services	Bolivia	26/11/2006
12	TIM Participacoes S.A.	Private Company	Mobile Telecom.	Brazil	04/04/2008
13	Duratex S.A.	Private Company	Construction	Brazil	20/02/2008
14	Celulose Irani S.A.	Private Company	Forestry & Paper	Brazil	07/11/2007
15	BRF Brasil Foods S.A.	Private Company	Food Producers	Brazil	28/05/2007
16	Dudalina SA	Private Company	Personal Goods	Brazil	23/01/2007
17	Beraca Sabara Quimicos...	Private Company	Chemicals	Brazil	04/01/2007
18	Chemtech Servicos de E...	Private Company	Industrial Equipment	Brazil	05/12/2006
19	Promon S.A.	Private Company	Industrial Equipment	Brazil	08/05/2006
20	INFRAERO	Unknown	Aerospace	Brazil	12/03/2004
21	CPFL Energia S.A.	Private Company	Electricity	Brazil	17/02/2004
22	Copagaz Distribuidora ...	Private Company	Oil Equipment	Brazil	27/06/2003
23	Furnas Centrais Eletri...	State-owned	Electricity	Brazil	27/06/2003

24	Klabin S.A.	Public Company	Forestry & Paper	Brazil	27/06/2003
25	Nutrimental S/A Indust...	Private Company	Food Producers	Brazil	27/06/2003
26	Souza Cruz	Private Company	Tobacco	Brazil	07/01/2003
27	Suzano Papel e Celulose	Private Company	Forestry & Paper	Brazil	07/01/2003
28	Samarco Mineracao S.A.	Private Company	Industrial Mining	Brazil	31/08/2002
29	ArcelorMittal Brasil	Private Company	Industrial Mining	Brazil	22/08/2001
30	Fibria Celulose S.A.	Public Company	Forestry & Paper	Brazil	26/07/2000
31	Natura Cosmeticos S/A	Private Company	Chemicals	Brazil	26/07/2000
32	Central de Restaurante...	Unknown	Beverages	Chile	29/03/2007
33	Telefónica	Private Company	Fixed Line Telecom.	Chile	19/11/2006
34	Aguas Andinas S.A.	Private Company	Gas, Water & Oil	Chile	07/08/2006
35	Poch & Asociados	Private Company	Support Services	Chile	01/05/2006
36	Pacific Rubiales Energy	Private Company	Oil & Gas Processing	Colombia	25/01/2011
37	Organizacion Terpel S.A	Private Company	Oil Equipment	Colombia	14/01/2011
38	Pichichi S.A Sugar Mill	Private Company	Food Producers	Colombia	28/01/2010
39	Harinera del Valle S.A.	Private Company	Food Producers	Colombia	18/01/2010
40	Datexco Company	Private Company	Support Services	Colombia	10/03/2009
41	Central Hidroelectrica...	Private Company	Electricity	Colombia	05/01/2009
42	Ingenio Risaralda, S.A.	Private Company	Food Producers	Colombia	19/03/2008
43	Invesa S.A.	Private Company	Chemicals	Colombia	19/03/2008
44	Eternit Colombiana S.A.	Private Company	Construction	Colombia	10/08/2007
45	Sociedades Bolivar S.A.	Private Company	Financial Services	Colombia	17/07/2007
46	Frisby S.A.	Private Company	Beverages	Colombia	28/06/2006
47	Arme S.A.	Private Company	General Retail	Colombia	27/06/2006
48	Empresa de Acueducto y...	State-owned	Gas, Water & Oil	Colombia	12/10/2005
49	Labfarve Fundacion Lab...	Private Company	Support Services	Colombia	04/10/2005

50	Empresa de Energia del...	Private Company	Electricity	Colombia	22/04/2005
51	Industrial Agraria La ...	Unknown	Food Producers	Colombia	27/01/2005
52	Endesa Colombia	Public Company	Gas, Water & Oil	Colombia	25/01/2005
53	Novartis de Colombia	Subsidiary	Pharmaceutical	Colombia	25/01/2005
54	Holcim (Colombia) S.A.	Private Company	Construction	Colombia	01/10/2004
55	BPZ Exploracion and Pr...	Private Company	Oil & Gas Processing	Peru	31/10/2007
56	Corporacion Pesquera I...	Private Company	General Retail	Peru	06/02/2007
57	LHH-DBM Peru	Private Company	Support Services	Peru	13/04/2004
58	Compania de Minas Buen...	Public Company	Industrial Mining	Peru	02/04/2004
59	Agricola Chapi S.A.	Unknown	Food Producers	Peru	31/03/2004
60	Banesco Banco Universal	Private Company	Banks	Venezuela	27/04/2009
61	Banco De Seguros Del E...	Private Company	Nonlife Insurance	Uruguay	03/09/2008
62	Pollpar S.A.	Unknown	Food Producers	Paraguay	20/12/2006
63	Vision Banco S.A.E.C.A.	Private Company	Financial Services	Paraguay	20/12/2006
64	Segtec	Private Company	Aerospace	Mexico	31/01/2011
65	Magnekon, S.A.	Private Company	Electronic	Mexico	05/01/2011
66	SRNS Latinoamerica S.A...	Private Company	Industrial Telecom.	Mexico	20/05/2010
67	Grupo SEICI	Private Company	Support Services	Mexico	05/03/2010
68	Maquinaria del Humaya ...	Private Company	Construction	Mexico	13/01/2009
69	Nomitek SA de CV	Private Company	Support Services	Mexico	13/01/2009
70	Genomma Lab Internacio...	Private Company	General Retail	Mexico	07/04/2008
71	Diseno y Metalmecanica...	Private Company	General Industry	Mexico	20/02/2008
72	Eli Lilly y Compania d...	Private Company	Pharmaceutical	Mexico	24/05/2007
73	Agricola Chaparral S.P...	Private Company	Food Producers	Mexico	30/03/2006
74	Industrias Penoles, S....	Private Company	Industrial Mining	Mexico	30/03/2006
75	Novartis Corporativo, ...	Private Company	Pharmaceutical	Mexico	18/01/2006

76	Satelites Mexicanos, S...	Private Company	Fixed Line Telecom	Mexico	18/01/2006
77	Cooperativa La Cruz Az...	Unknown	Construction	Mexico	16/01/2006
78	Arca Continental, S.A....	Public Company	Beverages	Mexico	16/01/2006
79	Riqras S.A. De C.V.	Private Company	Beverages	Mexico	14/06/2005
80	Fomento Economico Mexi...	Private Company	Beverages	Mexico	24/05/2005
81	CEMEX	Public Company	Construction	Mexico	06/12/2004
82	Mountain Equipment Co-op	Private Company	Personal Goods	Canada	20/02/2006
83	Rideau Recognition Sol...	Private Company	General Industry	Canada	11/02/2005
84	Talisman Energy Inc.	Public Company	Oil & Gas Processing	Canada	10/02/2004
85	BDP International, Inc	Private Company	General Industry	US	28/01/2010
86	Humanscale	Private Company	General Industry	US	20/01/2010
87	ScienceFirst, LLC	Private Company	Media	US	14/04/2009
88	Technibus, Inc	Private Company	Electronic	US	19/01/2009
89	North American Communi...	Private Company	Media	US	05/02/2008
90	Advanced Labelworx, Inc.	Private Company	General Industry	US	10/01/2008
91	Dalberg Global Develop...	Private Company	Support Services	US	01/06/2007
92	Sinak Corporation	Private Company	Construction	US	14/05/2007
93	Act Global	Private Company	General Retail	US	23/03/2006
94	The Coca-Cola Company	Public Company	Beverages	US	14/03/2006
95	The Omanhene Cocoa Bea...	Unknown	Not Applicable	US	26/05/2004
96	Allied Soft	Private Company	Software	US	11/05/2004
97	Starbucks Coffee Company	Public Company	Beverages	US	08/04/2004
98	Seagate Technology	Public Company	Technology	US	06/04/2004
99	Johnson Controls Inc.	Public Company	Automobiles	US	31/03/2004
100	Green Mountain Coffee ...	Public Company	Beverages	US	11/03/2004

Annex 6.1. Results from interviewed of the Rural Web assessment: Private Firm, University/Research Centre, and Local Authority

		Private Firms				University - research Institutions		National and Local Authorities (Forestal)						Municipal Authority
#	Pregunta	Person 1	Person 2	Person 3	Person 4	Person 5	Person 6	Person 7	Person 8	Person 9	Person 10	Person 11	Person 12	Person 30, Regente Municipal Cuatro cienegas, Coah
	SUSTAINABILITY													
1a	¿Como observa la actividad de recolección y proceso de candelilla hoy en día, cree que es un oficio duradero?	4	4	4	3	3	2	2	4	4	4	4	4	4
1b	Considera suficiente para su ingreso y su vida el oficio de recolección de candelilla?	3	3	3	2	3	1	2	3	3	3	3	3	3
1ci	Se ve a si mismo realizándola en: 5 años?	4	4	4	3	4	4	3	4	4	ND	4	4	4
1cii	Se ve a si mismo realizándola en: 10 años?	4	3	4	2	4	2	2	3	3	ND	3	3	3
1ciii	Se ve a si mismo realizándola en: 20 años?	3	2	3	1	3	2	1	2	2	ND	2	2	2
1d	Ve a sus hijos o los hijos del resto de los *candelilleros* realizando esta actividad como modo de vida?	4	4	4	3	4	3	3	3	3	ND	3	3	3
1e	¿Como imagina que será esta actividad en un futuro?	4	4	4	3	4	3	3	3	3	ND	4	2	2
1f	¿Cree que hay suficiente hierba para recolectar?	3	2	3	2	2	2	2	2	2	3	2	2	2
1g	¿Conoce las recomendaciones de recolección, dejar una tercera parte de la hierba? ¿Que tanto la sigue usted?	4	3	4	2	3	4	3	3	2	4	1	2	2
1gi	¿Que tanto la sigue la mayoría de los recolectores que conoce?	3	3	3	3	2	3	3	3	2	ND	1	2	2
1h	.-¿Conoce las campañas de reforestación?, Que tan efectivas cree que son para regenerar la hierba?	3	2	3	2	3	2	4	3	3	ND	4	2	2
	ENDOGENEITY													
2a	Que tanto dependen los *candelilleros* de externos (empresas, compradores o gobierno) para recolectar y procesar la candelilla?	2	2	2	1	3	1	2	4	3	1	4	4	4
2b	Que tanto dependen los *candelilleros* de externos (empresas, compradores o gobierno) para conseguir equipo de trabajo (pailas, acido, herramienta)?	1	1	1	1	1	2	1	1	1	1	1	1	1

2c	¿Qué tanto dependen los *candelilleros* de externos (empresas, compradores o gobierno) para entrenarse o conocer el oficio?	2	3	2	4	4	4	1	4	4	4	3	4	4
2d	¿Qué tan organizados están los *candelilleros* para crear bienes y mejoras en la comunidad (escuelas, clínicas, pavimentar caminos, pozos de agua, etc.)?	3	3	3	3	3	ND	2	2	3	ND	2	3	3
2e	¿Qué tan organizados están los *candelilleros* para dar mayor valor agregado a la cera (más limpia, más refinada, etc.)?	1	1	1	1	1	ND	2	2	3	2	2	3	3
NOVELTY PRODUCTION														
3a	¿Los *candelilleros* realizan cambios o mejoras propias en el proceso de recolección?	4	4	3	4	3	4	4	4	4	1	4	4	4
3b	¿Los *candelilleros* realizan cambios o mejoras propias en el cocido y cortado de candelilla para facilitar el proceso?	4	4	3	4	2	3	4	4	4	1	4	4	4
3c	¿Los *candelilleros* realizan cambios o mejoras propias en el cocido y cortado de candelilla para aumentar la cantidad de cera producida?	4	4	3	4	2	4	4	4	4	1	4	4	4
3d	¿Los *candelilleros* realizan cambios o mejoras propias en la conservación y reforestación de la hierba?	3	3	3	2	3	4	4	3	3	ND	3	3	3
3e	¿Los *candelilleros* buscan complementar la actividad de la candelilla con otras actividades (turismo ecológico, difusión cultural y tradiciones, otras aplicaciones o mercados)?	3	4	3	3	3	4	4	4	4	ND	4	4	4
SOCIAL CAPITAL														
4a	¿Que tanto se apoyan entre los mismos *candelilleros* (compartir conocimientos, técnicas, recursos, ayuda en general)?	4	4	4	3	4	ND	4	2	3	ND	2	3	3
4b	¿Qué tan organizados están los *candelilleros* para realizar actividades y conseguir beneficios en conjunto (comisariado, asociaciones, etc.)?	4	4	3	3	2	ND	4	2	3	ND	4	4	4
4c	¿Qué tan buena es la relación de los *candelilleros* de su comunidad con otras comunidades?	3	2	3	2	2	ND	2	2	3	ND	2	4	4
INSTITUTIONAL ARRANGEMENTS														
4d	¿Qué tan buena es la relación de los *candelilleros* con representantes del gobierno municipal?	3	2	3	2	1	ND	2	2	2	ND	3	4	4
4e	¿Qué tan buena es la relación de los *candelilleros* con las universidades e institutos de investigación?	2	1	3	1	2	ND	1	4	4	ND	3	4	4
4f	¿Qué tan buena es la relación de los *candelilleros* con los compradores?	3	3	3	3	4	ND	3	4	4	ND	3	3	3
GOVERNANCE OF MARKETS														
5a	¿Qué tanta influencia tienen los *candelilleros* en el precio de venta del cerote?	2	3	2	2	2	2	2	2	2	1	3	3	3

5b	¿Qué tanta influencia tienen los compradores en el precio de compra del cerote?	4	4	4	3	3	3	3	4	4	4	4	4	4
5c	¿Qué tanta influencia tienen los exportadores y usuarios finales en el precio de compra del cerote?	3	4	3	3	3	2	3	3	4	4	4	4	4
5di	¿Qué tan factible es para un *candelillero* producir un extra de cerote al mes? 10Kg extra?	4	4	4	3	3	4	3	4	4	ND	3	3	3
5dii	¿Qué tan factible es para un *candelillero* producir un extra de cerote al mes? 30Kg extra?	2	3	2	2	2	3	2	3	3	ND	2	2	2
5diii	¿Qué tan factible es para un *candelillero* producir un extra de cerote al mes? 60Kg extra?	1	2	1	1	1	2	1	2	2	ND	1	1	1
5ei	¿Qué tan factible es para un comprador comprar un extra de cerote al mes? 10Kg extra?	4	4	4	4	4	ND	4	4	4	ND	4	4	4
5eii	¿Qué tan factible es para un comprador comprar un extra de cerote al mes? 30Kg extra?	3	3	4	3	3	ND	4	4	4	ND	4	4	4
5eiii	¿Qué tan factible es para un comprador comprar un extra de cerote al mes? 60Kg extra?	2	2	3	2	2	ND	4	4	4	ND	4	4	4

Annex 6.1. Results from interviewed of the Rural Web assessment: Rural Communities from Nuevo León and Parras-Coahuila

	Rural collectors - Nuevo Leon Region								Rural collectors - Parras Coahuila Region								
Question #	Person 13, Icamole, García N.L.	Person 14, Icamole, García N.L.	Person 15, Carricitos, Mina, N.L.	Person 16, Arista, Mina N.L.	Person 17, Carricitos, Mina N.L.	Person 18, La Leona, Ramos Arizpe coah.	Person 19, La Leona, Ramos Arizpe Coah	Person 20, Dr. Arroyo	Person 21, 7 de Enero, Parras Coah.	Person 22, 7 de Enero, Parras Coah.	Person 23, 7 de Enero, Parras Coah.	Person 24, Los Lleguales, Parras Coah.	Person 25, Los Lleguales, Parras Coah.	Person 26, Sn Fco. Barrial, Parras, Coah	Person 27, Los Lleguales, Parras Coah.	Person 28, La constancia, Parras, Coah.	Person 29, Sn Fco. Del Barrial, Parras Coah
1a	3	3	3	4	4	3	3	3	4	3	3	4	4	4	4	4	4
1b	3	3	3	3	2	3	3	2	2	3	3	3	3	3	3	3	2
1ci	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4
1cii	4	4	3	3	3	3	3	3	3	2	2	3	4	3	4	3	4
1ciii	3	3	2	2	2	2	2	2	3	1	1	3	3	2	3	2	3
1d	3	3	3	3	3	2	2	2	2	3	3	2	3	4	3	3	3
1e	3	3	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4
1f	4	4	2	2	2	2	2	2	4	2	3	2	2	3	3	2	2
1g	2	2	2	2	2	2	2	3	2	2	2	3	3	2	3	3	3
1gi	2	2	1	1	1	2	2	3	2	2	2	3	3	2	2	2	2
1h	2	2	3	2	3	2	2	2	4	4	4	3	4	4	4	4	3
2a	1	1	4	4	4	2	2	2	4	4	4	4	4	4	4	4	3
2b	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1
2c	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2d	4	4	3	3	3	2	2	2	2	4	3	4	4	4	4	4	3
2e	1	1	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1
3a	4	4	3	3	3	3	3	3	4	4	4	4	4	4	3	3	3
3b	4	4	3	3	3	3	3	3	3	4	4	3	4	4	4	3	3
3c	4	4	3	3	3	3	3	3	4	4	4	3	4	4	4	3	3
3d	4	4	3	3	3	2	2	3	4	4	4	4	4	3	3	3	3
3e	2	2	4	4	4	4	4	4	2	4	4	4	4	4	4	4	4
4a	4	4	3	3	3	3	3	3	4	3	3	4	4	4	4	4	3
4b	4	4	4	4	4	4	4	2	4	4	4	4	4	4	4	4	4
4c	3	3	3	2	3	3	3	3	2	3	3	3	4	3	3	3	3
4d	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	1	1
4e	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4f	4	4	3	3	3	4	4	3	4	3	3	2	3	3	3	3	3

5a	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2
5b	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5c	3	3	4	4	4	4	4	3	3	3	3	3	3	3	3	3	4
5di	3	3	3	3	3	4	4	ND	4	4	4	3	3	3	3	3	4
5dii	2	2	2	2	2	3	3	ND	4	3	3	2	2	2	2	2	3
5diii	1	1	1	1	1	1	1	ND	2	1	2	1	1	1	1	1	2
5ei	4	4	4	4	4	4	4	ND	4	4	4	4	4	4	4	4	4
5eii	4	4	4	4	4	4	4	ND	4	4	4	4	4	4	4	4	4
5eiii	4	4	4	4	4	4	4	ND	4	4	4	4	4	4	4	4	4

Annex 6.1. Results from interviewed of the Rural Web assessment: Rural Communities from Cuatrocienegas-Coahuila and Zacatecas

	Rural collectors - Cuatrocienegas Coahuila Region								Rural collectors - Zacatecas Region			
Question #	Person 31, Las palomas, Cuatrocienegas, coah.	Person 32, Las Palomas, Cuatro cienegas	Person 33, estanque norias, Cuatrocienegas, Coah	Person 34, Reforma, Cuatrocienegas, coah	Person 35, Estanque de norias	Person 36, La reforma, Cuatrocienegas, Coah.	Person 37, Cuatrocienegas, coah	Person 38, Las palomas, cuatrocienegas, coah	Person 39, Los indios Romualdo, Mazapil Zac	Person 40, Los Indios Romualdo, Mazapil Zac	Person 41, 21 de Marzo, Mazapil, Zac	Person 42, 21 de Marzo, Mazapil, Zac
1a	4	4	4	4	4	4	4	4	4	4	4	4
1b	3	3	3	2	2	3	2	3	3	3	3	3
1ci	4	4	4	4	4	4	4	4	4	4	3	4
1cii	3	3	3	3	3	3	3	3	3	3	2	3
1ciii	2	2	2	2	2	2	2	2	2	2	1	2
1d	3	3	3	3	3	3	3	3	3	3	3	3
1e	2	2	2	2	2	2	2	2	4	4	4	4
1f	2	2	3	2	3	2	3	2	3	3	2	2
1g	2	2	2	2	2	2	2	2	3	3	3	3
1gi	2	1	1	1	1	1	1	1	2	2	2	2
1h	2	2	2	2	2	2	2	2	3	3	3	3
2a	4	4	4	4	4	4	4	4	2	3	2	3
2b	1	1	1	1	1	1	1	1	1	1	1	1
2c	4	4	4	4	4	4	4	4	3	4	3	4
2d	3	3	3	3	3	3	3	3	3	2	3	2
2e	3	3	3	3	3	3	3	3	3	3	3	3
3a	4	4	3	3	3	3	3	3	3	3	3	3
3b	4	4	3	3	3	3	3	3	3	3	3	3
3c	4	4	3	3	3	3	3	3	3	3	3	3
3d	3	3	3	3	3	3	3	3	3	3	3	3
3e	4	4	4	4	4	4	4	4	4	4	4	4
4a	3	3	3	3	3	3	3	3	3	3	3	3
4b	4	4	4	4	4	4	4	4	4	4	4	4
4c	4	4	3	3	3	2	2	3	3	3	2	2
4d	4	4	4	4	4	4	4	4	2	2	2	2
4e	4	4	3	3	3	3	3	3	1	1	1	1
4f	3	3	3	3	3	3	3	3	3	3	3	3

5a	3	3	3	3	3	3	3	3	3	3	3	3
5b	4	4	4	4	4	4	4	4	4	4	4	4
5c	4	4	4	4	4	4	4	4	4	4	4	4
5di	3	3	3	3	3	3	3	3	3	3	3	3
5dii	2	2	2	2	2	2	2	2	2	2	2	2
5diii	1	1	1	1	1	1	1	1	1	1	1	1
5ei	4	4	4	4	4	4	4	4	4	4	4	4
5eii	4	4	4	4	4	4	4	4	4	4	4	4
5eiii	4	4	4	4	4	4	4	4	4	4	4	4

Annex 7.1. Table of participants, groups and results

Subject	Group	Gender	Age	Initial capital	Qty of Purchases	Purchases (Total $)	Savings (Total $)	Qty of Common Invest.	Insurance purchase
1	1	Female	34	24	3	36	16	1	1
2	1	Female	33	12	-	-	8	1	1
3	1	Female	60	20	1	16	-	1	1
4	1	Female	56	8	2	12	-	1	1
5	2	Female	27	20	-	-	24	2	3
6	2	Male	33	8	5	24	18	2	3
7	3	Male	48	20	1	4	24	-	-
8	3	Male	34	16	-	-	8	1	2
9	3	Male	56	8	-	-	36	-	-
10	3	Male	63	12	-	-	-	-	1
11	4	Male	28	16	1	8	-	-	2
12	4	Male	28	8	3	16	-	-	-
13	4	Male	35	20	-	-	18	1	2
14	5	Female	42	12	1	16	40	-	-
15	5	Female	37	20	4	52	8	-	-
16	5	Female	45	12	2	40	8	-	-
17	5	Female	38	24	1	8	32	-	-
18	6	Female	55	24	2	52	24	-	-
19	6	Female	26	8	2	40	48	-	-
20	6	Female	49	4	3	52	16	-	-
21	6	Female	49	20	3	56	-	-	-
22	7	Female	25	16	1	16	24	-	-
23	7	Female	58	12	2	16	54	-	2
24	7	Female	29	4	2	8	8	-	-
25	7	Female	31	4	1	8	52	-	-
26	7	Female	53	16	2	20	-	-	-
27	7	Female	63	4	4	74	8	-	-
28	8	Female	39	20	1	20	64	-	-
29	8	Female	45	8	1	8	40	-	-
30	8	Female	41	4	1	36	32	-	-
31	8	Female	28	20	1	36	40	-	2
32	8	Female	50	20	2	44	16	-	2
33	9	Female	48	16	4	74	-	-	-
34	9	Female	24	8	3	70	-	-	-
35	9	Female	26	12	3	76	-	-	1
36	9	Male	32	12	3	72	-	-	-

37	10	Female	36	12	4	60	-	-	-
38	10	Female	42	12	2	20	-	-	-
39	10	Female	34	20	2	52	-	-	-
40	10	Female	48	4	1	18	-	-	-
41	11	Female	41	10	-	-	16	1	1
42	11	Female	19	8	-	-	24	1	-
43	11	Female	25	12	2	8	16	1	1
44	11	Female	39	8	-	-	-	1	-
45	12	Female	29	16	4	28	28	1	1
46	12	Male	37	24	6	72	-	1	-
47	12	Male	33	8	4	28	32	1	-
48	12	Male	35	20	5	62	32	1	1

Annex 7.2. Form for game records

Name _____

Event	Income	Expenses	Balance	Retribution	Savings

Summary

This dissertation assesses the feasibility of a form of public-private partnership within an Integrated Rural Development "IRD" strategy. IRD involves cooperation between private firms, policymakers, and citizens for the benefit of their rural region. This might be a good approach for, successful development. The main objective of this PhD thesis is to assess whether, from the perspective of the private firms, integrated rural development is a workable paradigm and, to illustrate, by means of a case study, its effects, potential and challenges.

The selected case study is based in the northern part of Mexico, in a territory known as the Chihuahuan desert. The area is composed primarily of a semi-arid ecosystem with extreme climatic conditions which limit the opportunities for agriculture and other economic activities. For most families, the collection, processing and commercialization of natural goods (principally non-timber forest products) represent their main means of employment and an important source of income. This dissertation analyses the integration of different actors involved in an economic activity based on the collection and processing of a natural good present in this area, known as the candelilla plant (*Euphorbia antisyphilitica*). Candelilla is an interesting case because of its potential contribution to poverty alleviation in marginal areas, and its unique potential to access markets across a wide variety of industries worldwide. It is believed that the potential demand could be at least ten times higher than the current sales figures, which were already in excess of US$ 7 million in 2010.

Traditionally, central governments have taken a leading role in encouraging different strategies for rural development. The classic strategies have generally been based on policies with different kinds of incentives, operative loans and subsidies. However, often, government-led strategies have struggled to achieve the expected results and to maximize the use of local resources. This is principally due to the generalized scope of these policies and their lack of flexibility, as well as to the centralized decision making, resource allocation and management processes involved. New approaches to rural development focus on the active participation of all rural stakeholders, supporting sustainable development through partnerships and strategic arrangements with rural actors. An increasing number of private firms have taken a proactive role in rural communities by getting involved in environmental and societal strategies alongside their economic

interests. The involvement of private firms is a key element for IRD strategies, because private firms can provide the means to develop economic activities that would generate benefits for their employees, customers, suppliers and associated society. However, participation in such strategies demands structural and, in some cases, profound cultural and social change by all the stakeholders involved. Stakeholders (policymakers, local representatives, private capital and rural citizens) are expected to shift from their traditional role into a more inclusive and pro-active role.

The main change expected from private firms, for instance, is to become more pro-active, moving from the traditional position as a mere 'buyer' or 'job provider', to act as a driving force for development. Private firms within an integrated value chain for natural goods are expected to act as a strategic partner, providing not only market opportunities for rural producers, but also to share with them the technology, skills, and knowledge necessary to help them to improve the added value of the rural outcome. From rural producers, IRD demands commitment to participate in production groups or cooperatives and a willingness to agree on a common strategy that covers the interests of the majority of the members. Stakeholders must also be committed to ensure correct operation according to the local regulations (fiscal, environmental and labour law). For the rest of the stakeholders IRD for example demands the commitment to facilitate the resources and the means to secure the proper development of the relevant actors. In return for their participation in IRD strategies, and in addition to the improvement in socio-economic aspects of the rural actors involved, private firms should also obtain other benefits, such as a continuous supply of products; strengthening of their supply chain; risk management actions; cost reduction through eco-efficiency and recycling; positive market recognition; access to specific niche markets; as well as improving employee morale and reducing staff turnover.

Most of the theoretical background related to IRD explores the expected changes in policies and interactions with the institutions involved, describing how organizational culture should be modified in order to ensure the success of these strategies. However, there is limited exploration on the interests and the drivers encouraging participation by key actors. Nor are the challenges that must be addressed when participating in IRD strategies sufficiently addressed. From the existing literature on IRD, this dissertation identified in chapter 2, for all stakeholders the most common motivating factors and the challenges that could be encountered taking into account the interests of each group. The

results from this theoretical analysis provided information about the main interests and drivers that encourage participation in integrated rural development strategies. In chapter 5, these findings were then confronted with the results from the selected case study. The empirical analysis in that chapter provided relevant information about the type of drivers that encouraged the actors in the case study (government, civic institutions, private firms and rural producers), to solve their challenges and to start-up an integrated rural development project.

In the case of private firms, a common question among developers, scholars and stakeholders, relates to the possible drivers that could trigger their integration in rural development strategies. Policy makers and recent empirical literature have identified Corporate Social Responsibility 'CSR' to be one of the main drivers for private firms' proactive involvement in environmental and societal strategies. To date, a broad variety of theoretical and empirical research exists on the role of private firms involved in rural development strategies through CSR. However, there are significant obstacles that must be addressed by firms when engaging in such strategies. For instance, companies undertaking costly initiatives could end up to be risking their price- competitiveness. Other obstacles are that this kind of multi-institutional interactions may result in bureaucracy and over-regulated processes, taking up resources and incurring costs for companies (principally during the early stages of the process) without generating meaningful societal benefits in return. For the management the challenge is to identify and decide which social causes and stakeholders should receive priority consideration in the decision-making process. In the public debate there is mainly a focus on these challenges and the opportunities to improve CSR in terms of regulations, transparency, reporting, measuring and applicability. However, with a broad concept such as CSR, what is also missing is an analysis of which strategies would best fit the interests of private firms when engaging in rural development. For decision makers convinced of the benefits and the applicability of CSR for rural development, there is only limited literature explaining the type of strategies that could be applied. The present dissertation includes in chapter three an empirical exploration of a set of companies that are currently applying rural development strategies through CSR. The exploration provided relevant information about the main challenges, motivations and the type of strategies deployed by the evaluated private firms.

For private firms, once they have identified their drivers and have established their CSR strategies for rural development, the journey towards successful outcomes is only just beginning. Although contemporary development policy prescriptions and empirical literature places emphasis on the potential for closer integration of poor producers with global markets, in practice, this integration represents a significant number of additional constraints generally not observed at the macro-level. The working relationship with small and medium scale producers, and principally with those from developing countries, which have a number of socio-economic disadvantages, represents additional complications and challenges for the chain stakeholders. This goes beyond the economic approach assessed by the traditional value chain analysis tools. This dissertation therefore in chapter six tests the application of a framework known as the Rural Web to the selected empirical case study. This framework offers the opportunity to empirically assess the interconnections between six different dimensions (sustainability, new institutional arrangements, endogeneity, market governance, social capital and novelty production) of the selected value chain. The Rural Web also facilitated the identification of analytical insights that would remain hidden when applying a linear (producer to consumer) analysis of a value chain. Moreover, greater understanding was achieved in relation to the strategic linkages - both between the actors involved in generating a product's value and also with other actors who have an indirect effect on the agribusiness value chain.

Another challenge for development strategies in general and thus also for IRD is to predict the effect on the communities of the benefits generated at the individual level. A factor that affects this is the willingness by community members to collaborate in communitarian strategies. In some cases, individual short-term self-maximizing behaviour undermines cooperation. Groups might not work unless the individual members are convinced that they would gain a personal benefit. This dissertation includes in chapter 7 an empirical analysis that seeks to identify how surplus income generated through the IRD project is used by the rural families involved. The main interest underlying this experiment was to anticipate whether rural producers would acquire assets or goods that, in turn, would generate future returns to improve their living conditions in the medium and long-term, as well as to assess their willingness to collaborate in the development of community goods such as clinics, schools and social spaces, among others. The empirical analysis provided relevant information about the expenditure behaviour of the evaluated rural producers, as well as on the potential ways in which they

could utilize an expected surplus income. The results provided also, information about the potential collaboration by the evaluated rural producers in the development of community goods (clinics, schools, social spaces, etc.)

The empirical and theoretical arguments provided in this dissertation demonstrated that Integrated Rural Development could be a workable rural development strategy. However, there are certain implications that need to be considered by the actors involved when applying IRD strategies. These implications include: to consider the characteristics, conditions, and preservation measures of available local resources; to design the development strategies based on local culture, customs and traditions; to develop the respective work plans and objectives with the support of local actors; to generate appropriate dialog channels among the actors involved in order to facilitate communication and understanding of each other's interests and needs; to identify the relationships and linkages that exist among the stakeholders involved; and finally to understand the development interests from the rural stakeholders involved, in order to facilitate the necessary means to promote acquisitions and investments that could contribute to their sustainable development.

Samenvatting

Deze dissertatie behandelt de haalbaarheid van een publiek-private samenwerking binnen een Integrale Plattelandsontwikkeling Strategie (Engels: Integrated Rural Development 'IRD') genoemd. IRD veronderstelt een samenwerking tussen private bedrijven, beleidsmakers en burgers die hun regio voordeel oplevert, wat kan resulteren in een succesvolle ontwikkeling. Het opzet van deze verhandeling is na te gaan of IRD voor privébedrijven een werkbaar paradigma kan zijn. De effecten, het potentieel en de uitdagingen hiervan illustreren we aan de hand van een in Noord-Mexico gesitueerde casus, meer bepaald in de Chihuahuan woestijn.

Dit gebied bestaat hoofdzakelijk uit een ecosysteem van halfdroog land en kent extreme klimatologische omstandigheden die de kansen op landbouw en andere economische activiteiten danig beperken. Voor de meeste families is het verzamelen, verwerken en vermarkten van natuurproducten (hoofdzakelijk bosproducten maar geen hout) de voornaamste bron van tewerkstelling en (dus) inkomsten. Deze verhandeling onderzoekt de integratie van verschillende actoren betrokken in een economische activiteit gebaseerd op het verzamelen en verwerken van een natuurproduct aanwezig in dit gebied, nl. de Candelilla plant (Euphorbia antisyphilitica). De Candelilla is een interessante casus omdat deze plant kan bijdragen tot het aanpakken van het armoedeprobleem in achtergestelde buurten, en omdat ze toegang biedt tot markten in een breed scala van sectoren wereldwijd. Aangenomen wordt dat de potentiële vraag nog tien keer hoger zou kunnen liggen dan de huidige verkoopcijfers, die reeds meer dan 7 miljoen dollar bedroegen in 2010.

Traditioneel gezien hebben centrale regeringen een leidende rol genomen in de plattelandsontwikkeling. De klassieke strategieën zijn over het algemeen gebaseerd op een aanmoedigingsbeleid met verschillende soorten premies, werkleningen en subsidies. Deze aanpak behaalt echter vaak niet de beoogde resultaten en slaagt er niet in om lokale middelen afdoende te maximaliseren. Dit is voornamelijk te wijten aan de generalisering die het beleid kenmerkt en haar gebrek aan flexibiliteit, maar ook aan het gecentraliseerde beslissingsproces, het toewijzen van middelen en de bestuursprocessen die erbij horen. Een nieuwe aanpak met betrekking tot plattelandsontwikkeling spitst zich toe op de actieve deelname van alle betrokken stakeholders en ondersteunt duurzame ontwikkeling door het smeden van partnerschappen en het maken van strategische afspraken met de

bewoners. Steeds meer particuliere bedrijven nemen een pro-actieve rol op in plattelandsgemeenschappen door zich naast de evidente economische- ook de milieu- en sociaal gerelateerde belangen aan te trekken. De betrokkenheid van deze bedrijven is een sleutelelement in IRD strategieën, omdat particuliere bedrijven de middelen hebben om economische activiteiten te ontwikkelen die voordelen kunnen generen voor hun personeel, klanten, leveranciers en de hieraan gelinkte gemeenschap. Zich inschrijven in dergelijke strategieën vereist structurele en in sommige gevallen diepgaande culturele en sociale veranderingen door alle betrokken stakeholders. Deze stakeholders (beleidsmakers, lokale vertegenwoordigers, privaat kapitaal en plattelandsbewoners) moeten evolueren van hun traditionele rol naar een meer inclusieve en pro-actieve rol.

De voornaamste kentering die de privébedrijven dienen te maken is op een pro-actieve manier te evolueren van louter koper of werkgever naar drijvende of stuwende kracht van de ontwikkeling. Privébedrijven in een integrale waardeketen voor natuurproducten dienen zich op te stellen als strategische partners, door niet louter marktopportuniteiten te creëren voor de lokale producenten maar ook de technologie, vaardigheden en kennis te delen en zo de meerwaarde op te krikken van de plattelandsresultaten. Van de lokale producenten vraagt IRD om deel te nemen in productiegroepen of coöperatieven en een bereidheid om een gemeenschappelijke strategie af te spreken die de belangen van de meerderheid van de leden behartigt. Stakeholders dienen een correcte afhandeling te garanderen in lijn met de lokale wetten en regels (fiscale-, milieugebonden- en arbeidswetten). Daarnaast vraagt IRD van de stakeholders de middelen en voorzieningen om een degelijke ontwikkeling van de relevante actoren te verzekeren. In ruil voor hun deelname aan IRD strategieën, en naast het verbeteren van de socio-economische aspecten van de betrokken plattelandsactoren, verkrijgen de privébedrijven nog andere voordelen, zoals een continue levering van producten; de versteviging van hun leveringsketen; risico management acties; kostenverlaging door eco-efficiëntie en recyclage; positieve marktverkenning: toegang tot specifieke nichemarkten; alsook het verbeteren van de moraal van het personeel en het tegengaan van personeelsverloop.

Het grootste gedeelte van de theoretische achtergrond gerelateerd aan IRD verkent de verwachte veranderingen in het beleid en de interactie met de betrokken instellingen terwijl het ook beschrijft hoe de organisatiecultuur zou moeten aangepast worden om het succes van deze strategieën te verzekeren. Er is echter een beperkte verkenning van de belangen en van dat wat deelname door de belangrijkste actoren aanmoedigt en vooruit

stuwt. Ook de uitdagingen die moeten worden aangepakt als men deelneemt aan IRD worden onvoldoende behandeld. Op basis van bestaande onderzoeksliteratuur identificeerde dit proefschrift in hoofdstuk twee voor alle betrokkenen de gangbaarste motiverende factoren en uitdagingen waarmee men geconfronteerd wordt rekening houdend met de belangen van elke groep. De resultaten van deze theoretische analyse verschaften informatie over de voornaamste belangen en elementen die deelname aanmoedigen in IRD strategieën. In hoofdstuk vijf werden deze bevindingen geplaatst tegenover de resultaten van de geselecteerde casus. De empirische analyse in dat hoofdstuk leverde relevante informatie op over het soort stimulerende elementen die de actoren in de casus (regering, maatschappelijke instellingen, privébedrijven en landelijke producenten) aanmoedigden om hun uitdagingen op te lossen en een geïntegreerd plattelandsontwikkelingsproject op te starten.

Wat privébedrijven betreft, is een algemeen gestelde vraag bij ontwikkelaars, onderzoekers en betrokkenen die naar de mogelijke stuwende elementen die aanleiding kunnen geven tot de integratie in plattenlandsontwikkelingsstrategieën. Beleidsmakers, en recent empirische onderzoeksliteratuur, hebben maatschappelijk verantwoord ondernemen geïdentificeerd als een van de belangrijkste stuwende krachten voor de proactieve betrokkenheid in milieu- en maatschappelijke strategieën van privébedrijven. Tot op heden bestaat een brede waaier van theoretisch en empirisch onderzoek over de rol van privébedrijven betrokken bij plattenlandsontwikkelingsstrategieën door middel van maatschappelijk verantwoord ondernemen (MVO). Er zijn nochtans significante obstakels die aangepakt moeten worden door bedrijven als ze zich engageren in dergelijke strategieën. Bijvoorbeeld, bedrijven die dure initiatieven opzetten, kunnen daarbij hun prijsconcurrentiepositie riskeren. Een ander obstakel is dat dit type interactie tussen verschillende instellingen zou kunnen resulteren in het ontstaan van bureaucratie en overgereguleerde processen die middelen opslorpen en de kosten van de bedrijven doen oplopen (vooral tijdens de eerste fases van het proces) zonder veel maatschappelijke voordelen te genereren. Voor het management is de uitdaging om te beslissen, na ze succesvol geïdentificeerd te hebben, welke sociale doelen en welke betrokkenen voorrang moeten krijgen in het beslissingsproces. In het publieke debat richt men zich hoofdzakelijk op de uitdagingen en kansen om MVO te verbeteren in termen van reglementen, transparantie, rapportering, meten en toepasbaarheid. Wat er echter ook ontbreekt bij een breed concept als MVO, is een analyse van de strategieën die het best

passen bij de belangen van privébedrijven wanneer zij zich engageren voor plattelandsontwikkeling. Voor beslissingsmakers overtuigd van de voordelen en de toepasbaarheid van MVO voor plattelandsontwikkeling is er slechts een beperkt aantal wetenschappelijke artikels waarin het soort van strategieën wordt uitgelegd die toegepast kunnen worden. Dit proefschrift neemt in hoofdstuk drie een empirische verkenning op van een aantal bedrijven die momenteel plattelandsontwikkelings-strategieën toepassen door middel van MVO. De verkenning geeft relevante informatie over de belangrijkste uitdagingen, motivatie en het type van strategieën ingezet door de geëvalueerde privébedrijven.

Het bepalen van hun stuwende krachten en het uitzetten van hun MVO-strategie is voor particuliere ondernemingen nog maar het begin van de zoektocht naar positieve resultaten. Hoewel hedendaagse voorschriften op niveau van ontwikkelingsbeleid én empirische literatuur de mogelijkheden van nauwere integratie van arme producenten met de wereldwijde markten stimuleren, stuit deze integratie in de praktijk op een aanzienlijk aantal beperkingen, in het algemeen niet waargenomen op macro-niveau. Samenwerken met kleine en middelgrote producenten – vooral die uit ontwikkelingslanden, die een aantal socio-economische nadelen hebben – zorgt voor bijkomende complicaties én uitdagingen voor de keten van stakeholders. Deze gaan verder dan de zuiver economische benadering die traditionele analyse-instrumenten voorop stellen. Daarom wordt in hoofdstuk zes het 'Rural Web' toegepast op onze case. Dit kader biedt de mogelijkheid om de onderlinge verbindingen tussen de zes verschillende dimensies van de geselecteerde waardeketen (duurzaamheid, nieuwe institutionele regelingen, endogeniteit, marktbestuur, sociaal kapitaal en innovatie) empirisch te beoordelen.

Het zorgt voor analytische inzichten die verborgen zouden blijven bij de toepassing van een lineaire (producent tot consument) analyse van de waardeketen. Het zorgt bovendien voor meer inzicht in de strategische banden tussen de betrokkenen die rechtstreeks de waarde van een product bepalen én de actoren die er een indirect effect op hebben.

Een andere uitdaging voor de ontwikkelingsstrategieën in het algemeen en (dus) voor IRD in het bijzonder, is om het effect te voorspellen van individueel verworven voordelen op de gemeenschappen. De bereidheid om samen te werken in functie van het algemeen belang, is van primordiaal belang. Kleinschalig kortetermijndenken en eigenbelang staat het hogere doel in de weg. Groepen kunnen alleen maar functioneren als de individuele

leden ervan overtuigd zijn dat ze er persoonlijk baat bij hebben. Hoofdstuk zeven gaat na hoe de door het IRD-project gegenereerde extra inkomsten door de plattelandsfamilies gebruikt worden. Worden ze geïnvesteerd in omzetverhogende goederen of diensten, met als doel de levenskwaliteit op middellange of lange termijn te verhogen? En/of zijn ze bereid de bijkomende middelen in dienst te stellen van het algemeen belang, door scholen, hospitalen en andere sociale voorzieningen (ziekenhuizen, scholen, sociale plekken, etc…) te financieren?

De empirische en theoretische argumenten in dit proefschrift laten zien dat Integrale Plattelandsontwikkeling een werkbare strategie voor plattelandsontwikkeling zoud kunnen zijn. Er zijn echter bepaalde gevolgen die in overweging moeten genomen worden door de betrokken spelers die de IRD strategie toepassen. Deze zijn onder meer: het in overweging nemen van de de kenmerken, toestand en bewaringsmaatregelen van de voorhanden zijnde lokale middelen; het ontwerpen van de ontwikkelings- strategieën in afstemming met de lokale cultuur, gewoonten en tradities; het ontwikkelen van de de respectieve werkplannen en doelstellingen met de steun van lokale actoren; het opstellen van passende kanalen voor dialoog tussen de betrokken met het oog op het vergemakkelijken van een goede communicatie en het begrip voor elkaars belangen en behoeften; het identificeren van de relaties en verbanden die er bestaan tussen de betrokken stakeholders; en uiteindelijk het begrijpen van de belangen voor ontwikkeling van de betrokken partijen, om zo de nodige middelen te faciliteren om overnames en investeringen te promoten die kunnen bijdragen aan de bevordering van duurzame ontwikkeling.

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Curriculum Vitae

Miguel Jaime Arato Garza was born on the 23rd of October 1980 in Monterrey, Nuevo León México. He attended to primary school from 1986 to 1992, and to secondary school from 1992 to 1997 at public institutions from the city of Monterrey. From 1997 to 2002, he coursed his undergraduate studies at the Universidad Autónoma de Nuevo León, also in Monterrey, Mexico, obtaining the bachelor degree of Industrial Administrator Engineer in the year of 2002.

Combined with his academic formation, his professional experience is mainly based on the private sector. In the year 1999, he worked as intern at the purchasing department of a Canadian metal casting and auto parts manufacturing company (Accuride de México) with operations in Monterrey. Also in the last 1.5 years of his undergrad studies (from 2000 to early 2002) he occupied an internship position at the technology department of a Mexican glass manufacturing company (Vitro). After completing his bachelor degree, in year 2002, he worked for a Mexican company (Cartolito) as Quality Assurance Engineer. His main duties and responsibilities were related to product and process quality supervision, as well as management of the internal Quality System. From 2004 to 2005 he occupied the position of Quality Assurance Engineer at an American ceramic tile manufacturer (Dal-Tile de Mexico), also in charge of quality assurance and quality system (ISO 9000). Pursuing for a career change into commercial activities, as well as for an improvement of his international experience and cultural intelligence, Miguel applied for a bi-lateral Mexico-Canada professional mobility program. In 2005 he moved to the city of Toronto, ON, Canada where he enrolled (during the period of July 2005 to July 2006) in an International Marketing certificate program at the University of Toronto, and to a professional certificate course about Business Skills and Leadership at the George Brown College, also in Toronto. During this period he also worked at two different companies. From Aug 2005 to July 2006, he worked as sales associate at RW&Co. Canada, and during January to July, 2006 as Quality assurance representative at BLP Bronze. After completing this period, in 2006 he occupied the position of Key Account Manager at Cartolito. During this assignment he was in charge for the maintenance and establishment of commercial relationships with Key customers from USA, Canada, Finland, Taiwan, China and others. Also during this period, he combined his professional experience with his academic formation by studying his Master degree in a joint executive program from Thunderbird School of Global Management at Phoenix, AZ, USA, and the Tecnológico

de Monterrey in Mexico. In the year 2009, he obtained his degree of Global Master of Business Administration (GMBA). In year 2010 he occupied the position of Business Unit Manager at a Mexican company (Multiceras), and in 2011 he got assigned the position of marketing manager in the same company. Also during this period he coursed executive programs about Management competencies at ICAMI School of professional formation in Monterrey.

After 1 year, he was promoted to the position of Marketing Manager at Multiceras, during this role, he was involved in Corporate Social Responsibility initiatives, and got in contact with rural producers that were part of their value chain. Looking for additional and innovative means to support the rural producers, their families and communities, he looked for experts and applied literature about rural development. He established contact with the Agricultural Economics Department at the Ghent University in Belgium, and started discussions about the possibility of an applied research through a doctorate degree. In 2012, after applying for an international mobility research grant from Consejo Nacional de Ciencia y Tecnología 'CONACYT' and the Instituto de Innovación y Transferencia de Tecnología 'I2T2' from Nuevo Leon, he was awarded with a scholarship to perform his doctorate studies at the Ghent University. The research project was also supported by Multiceras. During the period of 2012 to 2015, along with his PhD, Miguel collaborated with Multiceras as consultant, collaborating with different assignments at the department of Social Responsibility and Agribusiness.

Scientific Publications

Article in peer-reviewed international journals included in the Web of Science (A1)

Arato, M., Speelman, S. and Van Huylenbroeck, G. (2016), Corporate Social Responsibility Applied for Rural Development: An Empirical Analysis of Firms from the American Continent. Sustainability, 8, 102.

Arato, M., Speelman, S. and Van Huylenbroeck, G. (2014), "The contribution of non-timber forest products towards sustainable rural development: The case of Candelilla wax from the Chihuahuan Desert in Mexico". Natural Resources Forum. doi: 10.1111/1477-8947.12043

Article in peer-reviewed international journals not included in the Web of Science (A2)

Arato, Miguel, Speelman, Stijn and Van Huylenbroeck, Guido (2014), "Benefits and Challenges of Integrated Initiatives for Sustainable Rural Development: The Case from Northern Mexico". OIDA International Journal of Sustainable Development, Vol. 07, No. 04, pp. 31-48, 2014. Available at SSRN: http://ssrn.com/abstract=2489765

Articles published in conference proceedings (C1)

Arato, Miguel, Speelman, Stijn and Van Huylenbroeck, G. (2013) "Integración de la inversión privada en el desarrollo de la cadena de valor de los productos forestales no-maderables Mexicanos. Oportunidad para el desarrollo rural sostenible de las comunidades del Desierto de Chihuahua." Paper presented at the international conference: Comercio agrícola y América Latina: Cuestiones, controversias y perspectivas, held in Sept.19 and 20 at Buenos Aires, Argentina.

Arato M., Marmolejo M., Medellín C., Solis A., Speelman S. and Van Huylenbroeck G. (2014) Suministro Responsable de cera de Candelilla: Integración de la inversión privada en el desarrollo rural sustentable México. Administración de la Cadena de Suministro**:** Contribución de América Latina y el Caribe al Suministro Responsable. Edited by The Global Compact's Centro Regional de Apoyo para América Latina y el Caribe, Universidad Externado de Colombia and Cámara de Comercio de Bogota. ISBN: 978-958-57880-1-5. Available at: http://pactoglobal.org.ar/wp-content/uploads/2015/03/Administracion_Cadena_Suministro_Responsable.pdf

Participation in conferences

September, 2013. **International conference "Comercio Agrícola y América Latina"** organized by the World Trade Organization and University Flacso Argentina. Buenos Aires, Argentina. **Oral presentation.**

August, 2014. **International Conference on Sustainable Development 2014** organized by the International Centre for Interdisciplinary Research in Law (ICIRL) at Laurentian University Centre for Research in Social Justice and Policy (CRSJP) at Laurentian University and Ontario International Development Agency (OIDA) in Toronto ON. Canada. **Oral presentation**

S**eptember, 2015. The 5th World Sustainability Forum.** Organized by MDPI, The Sustainability journal and Basel University. Basel, Switzerland, 2015. **Oral presentation.**

March, 2015. Forum for the future of Agriculture, Organized by European Landowners Organization, (ELO) and Syngenta, Brussels, Belgium. **Participation**

June, 2015. Workshop on Private financing for biodiversity in Europe, Organized by the European Commission, Brussels, Belgium. **Participation**